



Fall Education Seminar
October 5, 2023

Technical issue update

presented by


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National Roofing Contractors Association (NRCA)



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Roofing industry market conditions

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ARMA Releases Second Quarter 2023 Report on Asphalt Roofing Product Shipments

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Asphalt Roofing Product Shipments

Shipments (squares)	Q2 2023	Q2 2022	% Change	YTD 2023	YTD 2022	% Change
Shingles – U.S. (including individual shingles)	51,713,740	45,521,069	13.6%	85,541,254	88,449,004	-3.3%
BUR base, ply, and mineral cap sheets – U.S. (not including saturated felts)	1,806,472	2,019,867	-10.6%	3,183,661	3,837,525	-17.0%
Modified Bitumen – U.S.	12,069,534	11,457,575	5.3%	21,703,749	21,315,786	1.8%
Shingles – Canada (including Individual shingles)	2,401,536	3,906,364	-38.5%	5,792,325	7,455,919	-22.3%

About ARMA:

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

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ABC: Monthly Construction Input Prices Increased 1.5% in August

Producer Price Index, August 2023			
	1-Month % Change	12-Month % Change	Change Since Feb 2020
Inputs to Industries			
Inputs to Construction	1.5%	-0.2%	40.7%
Inputs to Multifamily Construction	1.0%	0.8%	38.7%
Inputs to Nonresidential Construction	1.5%	0.2%	41.5%
Inputs to Commercial Construction	0.9%	0.1%	41.1%
Inputs to Healthcare Construction	0.9%	0.1%	40.5%
Inputs to Industrial Construction	1.4%	1.9%	36.7%
Inputs to Other Nonresidential Construction	1.7%	0.1%	41.7%
Inputs to Maintenance and Repair Construction	1.7%	-0.7%	38.9%
Commodities			
Adhesives and Sealants	-0.2%	2.8%	33.8%
Brick and Structural Clay Tile	-0.1%	6.4%	24.8%
Concrete Products	0.5%	8.7%	32.2%
Construction Machinery and Equipment	-0.5%	6.0%	26.5%
Copper Wire and Cable	0.1%	3.2%	28.8%
Crude Petroleum	8.9%	-12.5%	66.5%
Fabricated Structural Metal Products	0.1%	-1.5%	51.8%
Gypsum Products	-0.6%	-0.8%	41.0%
Hot Rolled Steel Bars, Plates, and Structural Shapes	1.3%	-9.7%	55.3%
Insulation Materials	-0.7%	2.3%	37.1%
Iron and Steel	0.3%	-10.3%	60.6%
Lumber and Wood Products	-1.1%	-9.4%	25.3%
Natural Gas	-6.3%	-77.7%	27.9%
Plumbing Fixtures and Fittings	0.5%	2.3%	18.2%
Prepared Asphalt, Tar Roofing and Siding Products	-1.2%	3.2%	39.4%
Softwood Lumber	-4.4%	-18.0%	16.3%
Steel Mill Products	-0.5%	-14.8%	75.0%
Switchgear, Switchboard, Industrial Controls Equipment	0.4%	6.7%	37.4%
Unprocessed Energy Materials	5.4%	-40.6%	72.9%

Source: U.S. Bureau of Labor Statistics

Switchgear, Switchboard, Industrial Controls Equipment 0.4% 6.7% 37.4%
 Unprocessed Energy Materials 5.4% -40.6% 72.9%

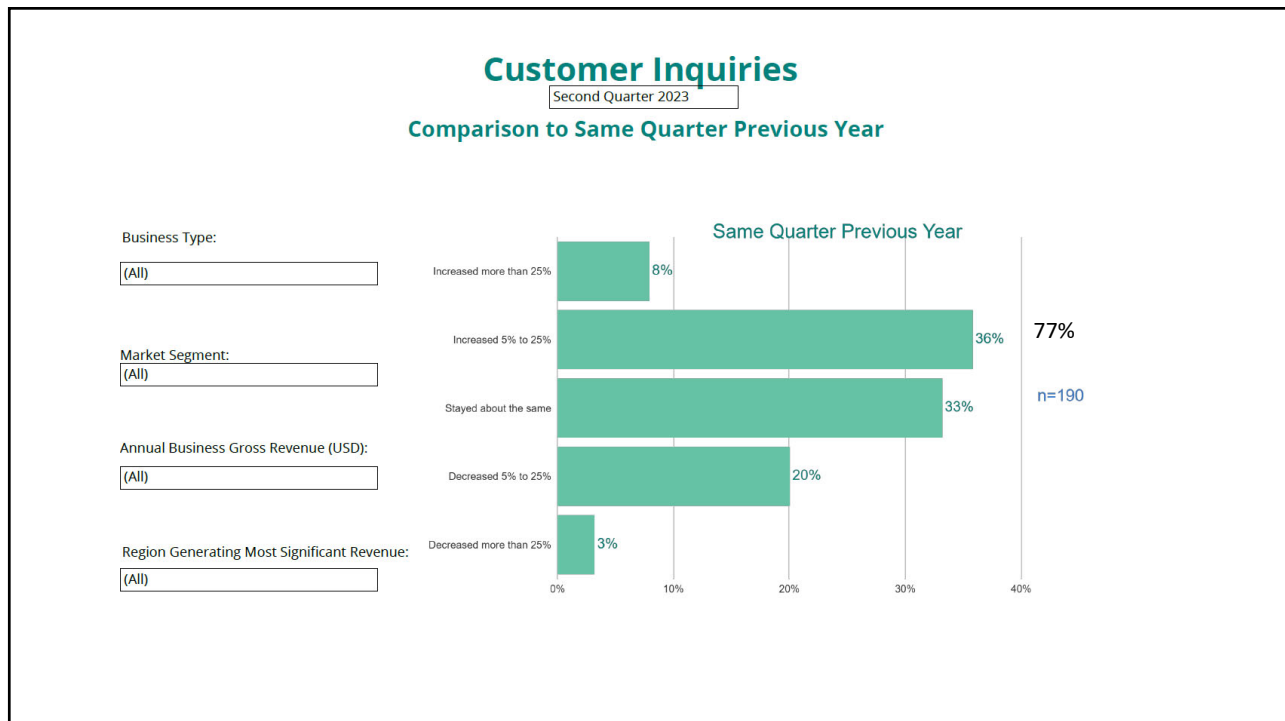
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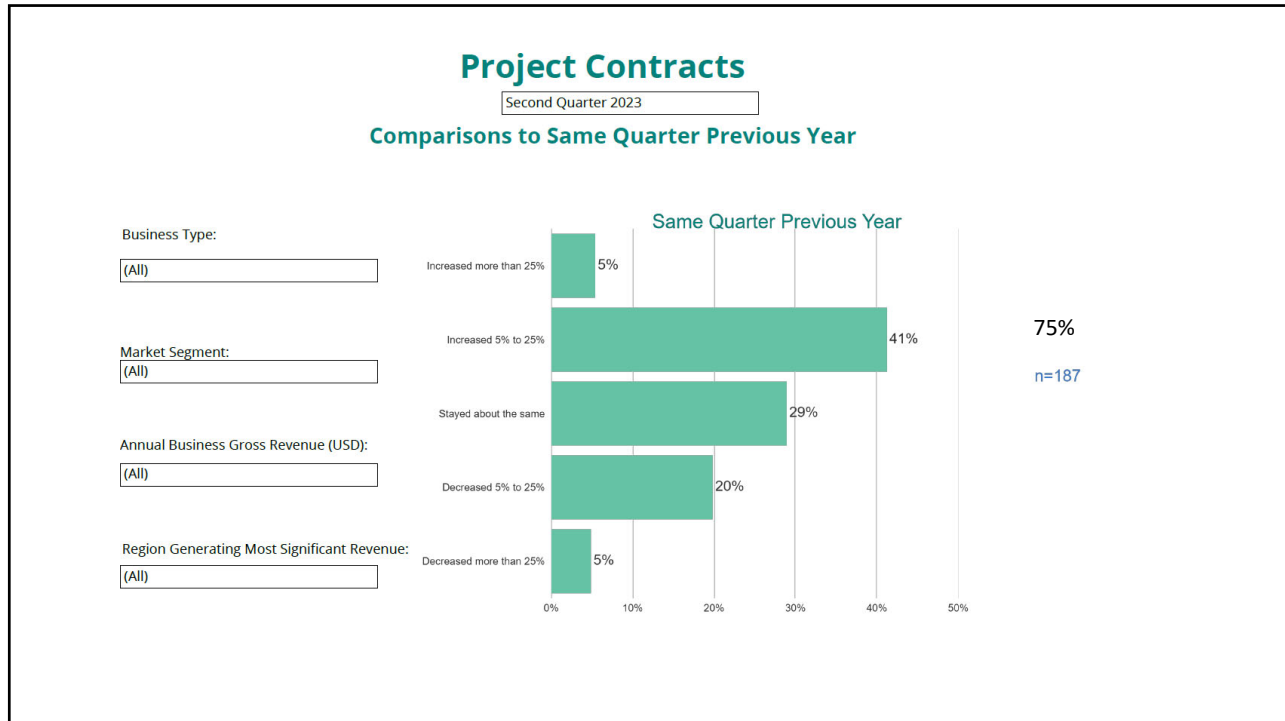
Market Index Survey for REROOFING

ASPHALT ROOFING MANUFACTURERS ASSOCIATION | CFFA CHEMICAL FABRICS & FILM ASSOCIATION, INC. | CRCA CANADIAN ROOFING CONTRACTORS ASSOCIATION | ERA 20 EPDM ROOFING ASSOCIATION | IIBEC 40 INTERNATIONAL INSTITUTE OF BUILDING ENCLOSURE CONSULTANTS | MCA METAL CONSTRUCTION ASSOCIATION | MRA METAL ROOFING ALLIANCE | NRCA NATIONAL ROOFING CONTRACTORS ASSOCIATION | NWR National Women in Roofing | PIMA POLYISOCYANURATE INSULATION MANUFACTURERS ASSOCIATION | RCMA ROOF COATINGS MANUFACTURERS ASSOCIATION | SPRI SINGLE PLY ROOFING INDUSTRY

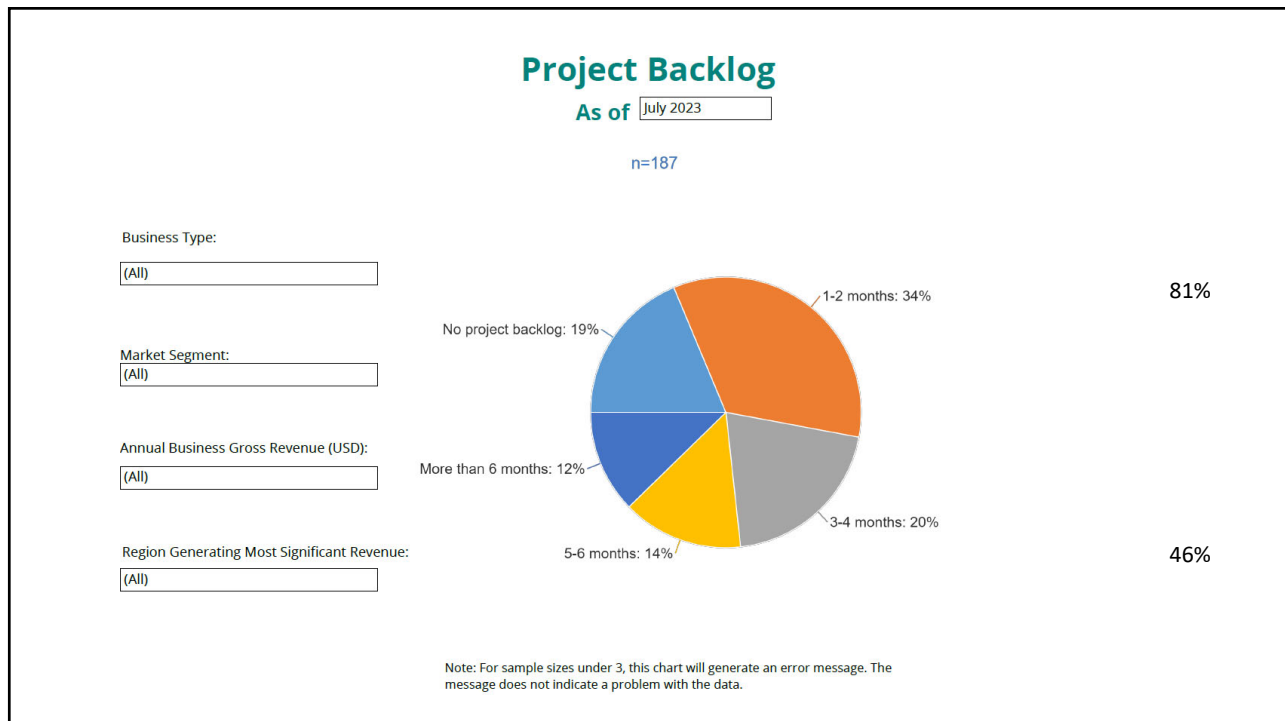
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Project Contracts Index

	Fourth Quarter 2020	First Quarter 2021	Second Quarter 2021	Third Quarter 2021	Fourth Quarter 2021	First Quarter 2022	Second Quarter 2022	Third Quarter 2022	Fourth Quarter 2022	First Quarter 2023	Second Quarter 2023
Primarily Steep Slope	59.5	73.1	65.7	62.5	58.0	51.8	50.0	42.0	43.3	60.0	50.0
Primarily Low Slope	43.5	58.0	67.4	61.8	61.6	68.4	66.0	65.5	58.9	61.7	60.5
Blend Between Steep Slope and Low Slope	53.2	54.9	69.6	55.7	61.5	57.6	51.0	62.8	53.8	64.5	65.9
Total	50.1	58.1	68.2	59.4	61.1	62.1	59.2	61.9	55.2	62.5	61.0

The index is equal to the percent indicating that project contracts have increased when compared to the same quarter of the previous year, plus one half who have reported no change. The total is multiplied by 100 to create the index. A score of 50 or higher suggests expansion or optimism, while a value below 50 indicates contraction or pessimism (red cells).

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Q3 2023 survey is open until October 16.
To participate: [Link](#)

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Radio frequency radiation
Rooftop cell phone transmitters


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Rooftop cell phone transmitters



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Advisory Bulletin 

JUNE 2023

CRCA Advisory Bulletin

June 2023

Radiofrequency Radiation and Electromagnetic Fields

The increased number of cellular antennas and other communication equipment that generates radiofrequency radiation (RF) and electromagnetic fields (EMF) may be exposing roofers and other contractors to harmful levels of radiations when working on rooftops, sides of buildings and other locations where RF generating antennas are located. This bulletin will focus on radiation types, safety limits and mitigating exposure.

With the ever-increasing use and development of communication technology, there is an increased risk for those working in and around communication devices and equipment that emit radiofrequency electromagnetic fields (EMF) such as smart meters, cell phone towers and equipment using 5G technology. Roof areas are often prime locations for this type of equipment and anyone accessing these roof areas for any reason should be aware of the Occupational Health and Safety requirements and the Safety Code 6. Consult with provincial and/or federal authorities having jurisdiction for further information/guidance for most stringent requirements.

What is Radiofrequency (RF) Radiation?

There are two types of radiation – ionizing radiation and non-ionizing radiation. Both are forms of electromagnetic energy, but ionizing radiation has more energy than non-ionizing radiation. Ionizing radiation, like x-rays or gamma rays, has enough energy to cause chemical changes by breaking chemical bonds. Sources of this type of radiation can be found in hospitals, nuclear energy plants, and nuclear weapons facilities. Non-ionizing radiation causes molecules to vibrate, which generates heat. RF radiation is a type of non-ionizing radiation and is the energy used to transmit wireless information. RF radiation is invisible and power levels of equipment and amount of RF radiation can fluctuate without warning.

About Safety Code 6

Health Canada publishes Safety Code 6¹ which sets out recommended safety limits for human exposure to radiofrequency electromagnetic fields (EMF) in the frequency range from 3 kHz to 300 GHz. This range covers the frequencies used by communications devices and equipment that emit radiofrequency EMF such as: Wi-Fi, cell phones, smart meters, cell phone towers, those using 5G technology.


Safety Code 6 is reviewed on a regular basis to confirm that it continues to provide protection against all known potentially adverse health effects. If new scientific evidence were to show that exposure to radiofrequency EMF below the levels found in Safety Code 6 poses a risk, the Government of Canada would take steps to protect the health of Canadians.

¹<https://www.canada.ca/en/health-canada/services/health-risks-safety/radiation/occupational-exposure-regulations/safety-code-6-radiofrequency-exposure-guidelines.html>

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[Link](#)

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How protect yourself from RF radiation

The risks associated with RF radiation increases with the number of devices present, the closer a worker is to the equipment/device(s), and the more time that is spent in the area. Workers can protect themselves by the following:

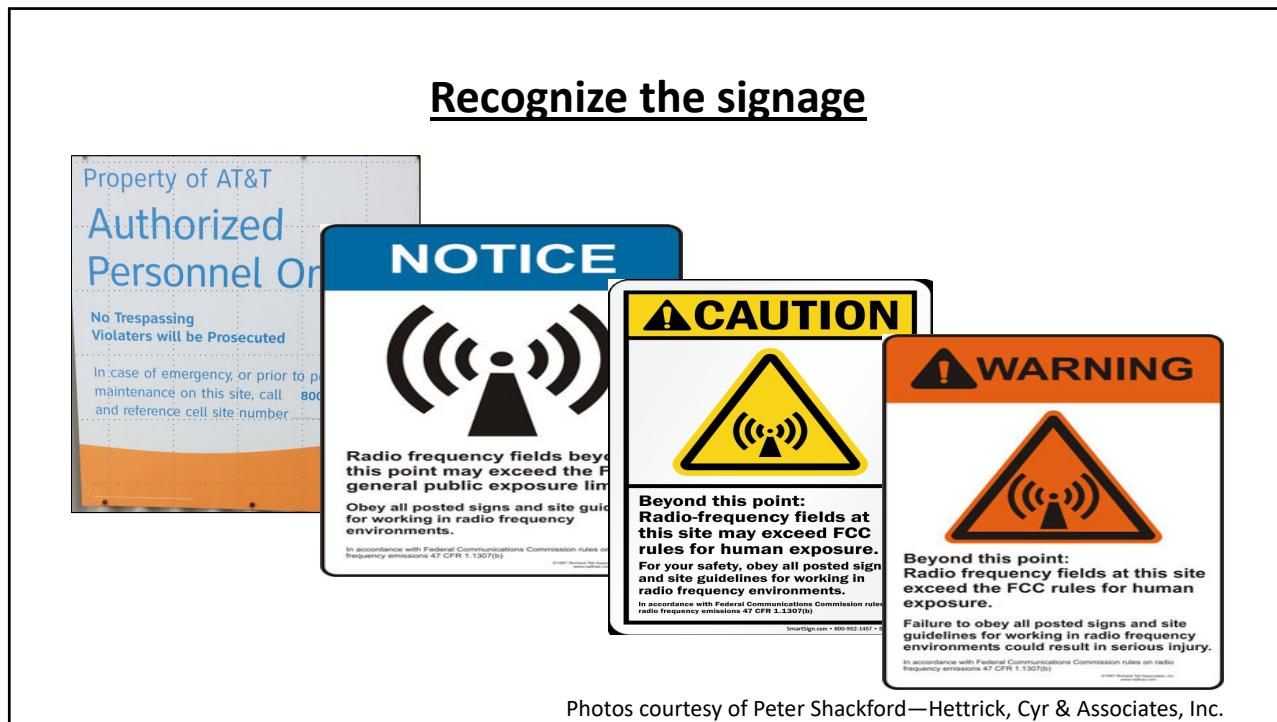
How protect yourself from RF radiation

The risks associated with RF radiation increases with the number of devices present, the closer a worker is to the equipment/device(s), and the more time that is spent in the area. Workers can protect themselves by the following:

- Complete a visual assessment of the area to determine if cellular antennas or other RF radiation generating antennas are present. If you are not sure, ask your supervisor, the building owner, or the property manager if RF-generating antennas are present where you need to work. The building owner or property manager should have the information, or know whom to contact for information about antennas, their locations, and the RF radiation levels.
- Look for warning signs posted near RF antennas; the signs should identify the hazard and tell you where to get more information.
- Contact the building owner/manager and the antenna licensee to have the equipment temporarily powered down or moved.

The opinions expressed herein are those of the CRCA National Technical Committee. This Advisory Bulletin is circulated for the purpose of providing roofing information to the attention of the reader. The data, commentary, opinions and conclusions, if any, are not intended to provide the reader with conclusive technical advice and the reader should not act only on the roofing information contained in this Advisory Bulletin without seeking specific professional, engineering or architectural advice. Neither the CRCA nor any of its officers, directors, members or employees assumes any responsibility for any of the roofing information contained herein or the consequences of any interpretation which the reader may take from such information.

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How protect yourself from RF radiation

The risks associated with RF radiation increases with the number of devices present, the closer a worker is to the equipment/device(s), and the more time that is spent in the area. Workers can protect themselves by the following:

- Complete a visual assessment of the area to determine if cellular antennas or other RF radiation generating antennas are present. If you are not sure, ask your supervisor, the building owner, or the property manager if RF-generating antennas are present where you need to work. The building owner or property manager should have the information, or know whom to contact for information about antennas, their locations, and the RF radiation levels.
- Look for warning signs posted near RF antennas; the signs should identify the hazard and tell you where to get more information.
- Contact the building owner/manager and the antenna licensee to have the equipment temporarily powered down or moved.

If work needs to be performed within a potentially hazardous area:

- Check the site survey or roof plan for potential exposure levels
- Pre-plan work tasks and travel routes so you can limit trips through the RF field and time spent on tasks there – the goal is to get in and out as quickly as possible.
- Avoid standing directly in front of or close to an antenna. As a rule of thumb, stay 1.5 m (6 feet) away from a single antenna and 3 m (10 feet) away from a group of antennas.
- Use a personal RF monitor. The monitor will warn you if you are in an area where RF radiation is at a dangerous level. There are several handheld EMF personal safety monitors available on the market that measure exposure and allow workers to work in an exposed area for a limited time. Use personal monitors and protective clothing while work is being performed and if an alarm sounds, stop work and leave the area immediately.

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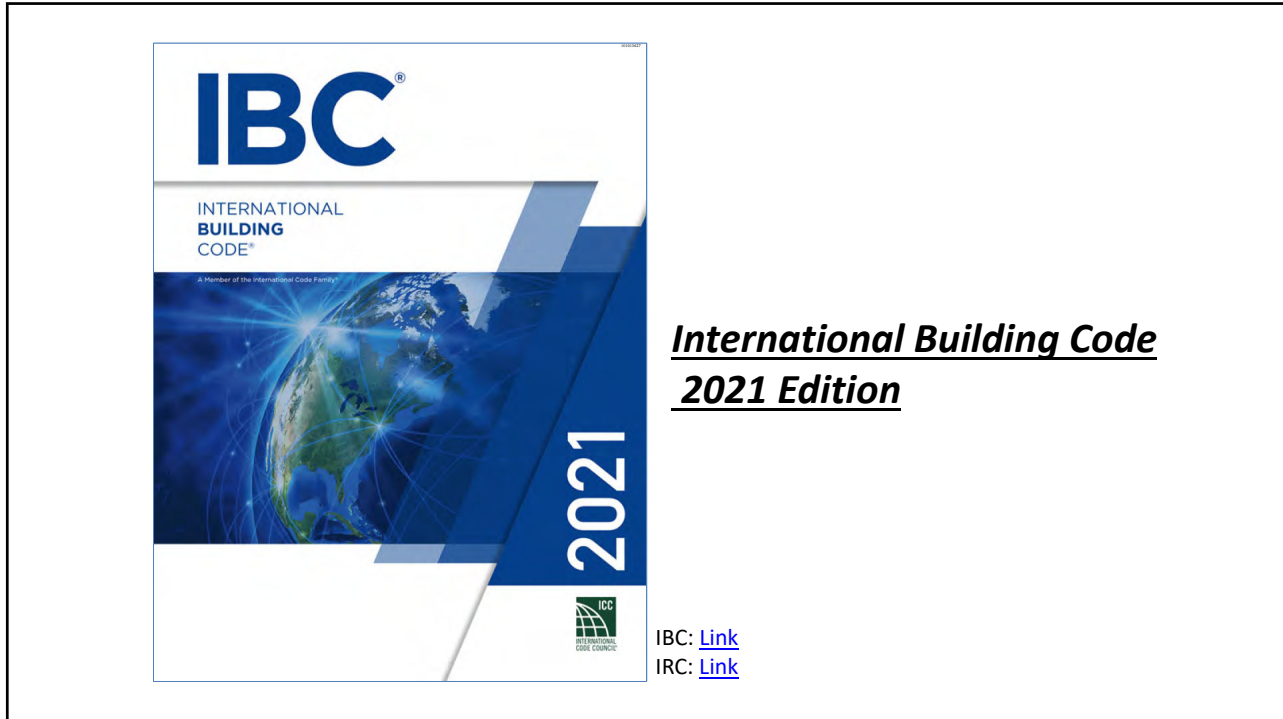
Some useful references

- CRCA Advisory Bulletin ([Link](#))
- Health Canada's Safety Code 6 ([Link](#))
- Federal Communications Commission ([Link](#))
- Center for Construction Research and Training ([Link](#))

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Underlayment

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International Building Code
2021 Edition

IBC: [Link](#)
IRC: [Link](#)

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TABLE 1505.4 MINIMUM ROOF COVERING CLASSIFICATION FOR TYPES OF CONSTRUCTION*									
IA	IB	IIA	IBS	IIIA	IIIB	IIIC	IV	VA	VB
B	B	B	C	B	C	B	C	B	C
<p>For SI, 1 foot = 304.8 mm, 1 square foot = 0.0929 m².</p> <p>a. Unless otherwise required in accordance with the International Building Code or other applicable code or due to the location of the building within a fire district as accordance with Appendix D.</p> <p>b. Nonclassified roof coverings shall be permitted on buildings of Group R-3 and Group U occupancies, where there is a minimum fire-separation distance of 5 feet measured from the leading edge of the roof.</p> <p>c. Buildings that are not more than two stories above grade plane and having not more than 4,000 square feet of proposed roof area and where there is a minimum 10-foot fire-separation distance from the leading edge of the roof to a lot line on all sides of the building, except for streets, fronts or public ways, shall be permitted to have roofs of No. 1 cedar or redwood shingles and No. 1 shingles installed in accordance with Section 1505.7.</p> <p>[B] 1505.2 Class A roof assemblies. Class A roof assemblies are those that are effective against severe fire test exposure. Class A roof assemblies and roof coverings shall be listed and identified as Class A by an approved testing agency. Class A roof assemblies shall be permitted for use in buildings or structures of all types of construction.</p> <p>Exceptions:</p> <ol style="list-style-type: none"> Class A roof assemblies include those with coverings of brick, masonry or an exposed concrete roof deck. Class A roof assemblies also include ferrous or copper shingles or sheets, metal sheets and shingles, clay or concrete roof tile or slate installed on noncombustible decks or ferrous, copper or metal sheets installed without a roof deck on noncombustible framing. Class A roof assemblies include minimum 16 ounce per square foot (0.0416 kg/m²) copper sheets installed over combustible decks. Class A roof assemblies include slate installed over ASTM D2125, Type II underlayment over combustible decks. <p>[B] 1505.3 Class B roof assemblies. Class B roof assemblies are those that are effective against moderate fire-test exposure. Class B roof assemblies and roof coverings shall be listed and identified as Class B by an approved testing agency.</p> <p>[B] 1505.4 Class C roof assemblies. Class C roof assemblies are those that are effective against light fire-test exposure. Class C roof assemblies and roof coverings shall be listed and identified as Class C by an approved testing agency.</p> <p>[B] 1505.5 Nonclassified roofing. Nonclassified roofing is approved material that is not listed as a Class A, B or C roof covering.</p> <p>[B] 1505.6 Fire-retardant-treated wood shingles and shakes. Fire-retardant-treated wood shingles and shakes shall be treated by impregnation with chemicals by the full-cell vacuum-pressure process, in accordance with ANFA C1. Each bundle shall be marked to identify the manufacturer unit and the manufacturer, and shall be labeled to identify the classification of the material in accordance with the testing required in Section 1505.1, the testing company and the quality control agency.</p> <p>[B] 1505.7 Special purpose roof. Special purpose wood shingle or wood shake roofing shall conform to the grading and application requirements of Section 1507.8 or 1507.9. In addition, an underlayment of 1/2-inch (12.7 mm) Type XX water-resistant gypsum backing board or gypsum sheathing shall be placed under minimum nominal 1/2-inch-thick (12.7 mm) wood structural panel solid sheathing or 1-inch (25 mm) nominal spaced sheathing.</p> <p>[B] 1505.8 Building-integrated photovoltaic (BIPV) products. BIPV products installed as the roof covering shall be tested, listed and labeled for fire classification in accordance with Section 1505.1.</p> <p>[B] 1505.9 Rooftop mounted photovoltaic (PV) panel systems. Rooftop mounted photovoltaic (PV) panel systems shall be tested, listed and identified with a fire classification in accordance with UL 2703. Listed systems shall be installed in accordance with the manufacturer's installation instructions and their listing. The fire classification shall comply with Table 1505.1 based on the type of construction of the building.</p> <p>[B] 1505.10 Landscaped roofs. Landscaped roofs shall comply with Sections 1505.1 and 1507.13 and shall be installed in accordance with ANSISF21-VF-1.</p>									
<p>SECTION 1506 MATERIALS</p> <p>1506.1 Scope. The requirements set forth in this section shall apply to the application of roof-covering materials specified herein. Roof coverings shall be applied in accordance with this chapter and the roof covering listing as required by Section 1505. Installation of roof coverings shall comply with the applicable provisions of Section 1507.</p> <p>1506.2 Material specifications and physical characteristics. Roof-covering materials shall conform to the applicable standards listed in this chapter.</p> <p>1506.3 Product identification. Roof-covering materials shall be delivered in packages bearing the manufacturer's identifying marks and approved testing agency labels required in accordance with Section 1505. Bulk shipments of materials shall be accompanied with the same information issued in the form of a certificate or on a bill of lading by the manufacturer.</p>									
<p>SECTION 1507 REQUIREMENTS FOR ROOF COVERINGS</p> <p>1507.1.1 Underlayment. Underlayment for asphalt shingles, clay and concrete tile, metal roof shingles, mineral-surfaced roll roofing, slate and slate-type shingles, wood shingles, wood shakes, metal roof panels and photovoltaic</p>									

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shingles shall conform to the applicable standards listed in this chapter. Underlayment materials required to comply with ASTM D226, D1970, D4869 and D6757 shall bear a label indicating compliance with the standard designation and, if applicable, type classification indicated in Table 1507.1.1(1). Underlayment shall be applied in accordance with Table 1507.1.1(2). Underlayment shall be attached in accordance with Table 1507.1.1(3).

Exceptions:

- As an alternative, a minimum 4-inch-wide (102 mm) strip of self-adhering polymer modified bitumen membrane complying with ASTM D1970 and installed in accordance with the manufacturer's installation instructions for the deck material shall be applied over all joints in the roof decking. An approved underlayment for the applicable roof covering for design wind speeds less than 120 mph (54 m/s) shall be applied over the 4-inch-wide (102 mm) membrane strips.
- As an alternative, two layers of underlayment complying with ASTM D226 Type II or ASTM D4869 Type IV shall be permitted to be installed as follows: Apply a 19-inch (483 mm) strip of underlayment parallel with the eave. Starting at the eave, apply 36-inch-wide (914 mm) strips of underlayment felt, overlapping successive sheets 19 inches (483 mm). The underlayment shall be attached with corrosion-resistant fasteners in a grid pattern of 12 inches (305 mm) between side laps with a 6-inch (152 mm) spacing at side and end laps. End laps shall be 4 inches (102 mm) and shall be offset by 6 feet (1829 mm). Underlayment shall be attached using metal or plastic cap nails with a nominal cap diameter of not less than 1 inch (25.4 mm). Metal caps shall have a thickness of not less than 31-gauge sheet metal. Power-driven metal caps shall have a thickness of not less than 0.010 inch (0.254 mm). Thickness of the outside edge of plastic caps shall be not less than 0.035 inch (0.89 mm). The cap nail shank shall be not less than 0.083 inch (2.1 mm) for ring shank cap nails and 0.091 inch (2.3 mm) for smooth shank cap nails. The cap nail shank shall have a length sufficient to penetrate through the roof sheathing or not less than 1/2 inch (12.7 mm) into the roof sheathing.

3. Structural metal panels that do not require a substrate or underlayment.

1507.1.2 Ice barriers. In areas where there has been a history of ice forming along the eaves causing a backup of water, an ice barrier shall be installed for asphalt shingles, metal roof shingles, mineral-surfaced roll roofing, slate and slate-type shingles, wood shingles, and wood shakes. The ice barrier shall consist of not less than two layers of underlayment cemented together, or a self-adhering polymer modified bitumen sheet shall be used in place of normal underlayment and extend from the lowest edge of all roof surfaces to a point not less than 24 inches (610 mm) inside the exterior wall line of the building.

Exception: Detached accessory structures that do not contain conditioned floor area.

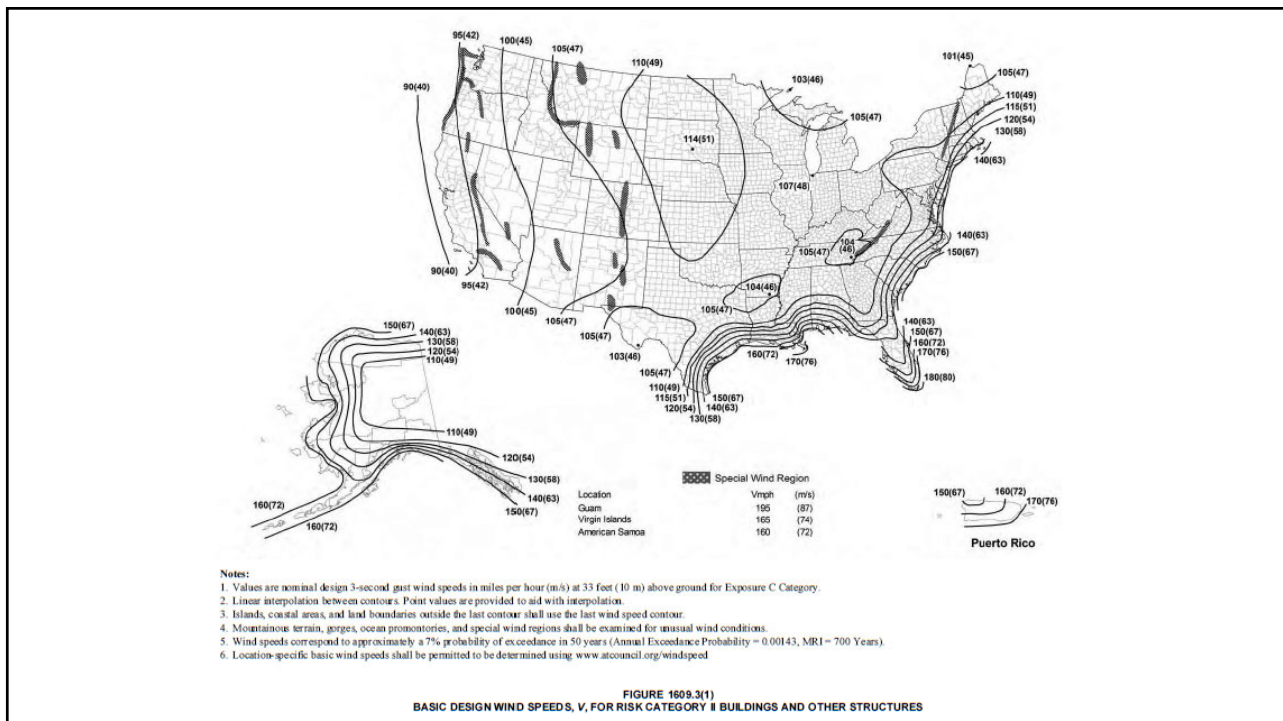
TABLE 1507.1.1(1) UNDERLAYMENT TYPES

ROOF COVERING	SECTION	MAXIMUM BASIC DESIGN WIND SPEED, V < 140 MPH	MAXIMUM BASIC DESIGN WIND SPEED, V ≥ 140 MPH
Asphalt shingles	1507.2	ASTM D226 Type I or II ASTM D4869 Type I, II, III or IV ASTM D6757	ASTM D226 Type II ASTM D4869 Type IV ASTM D6757

Roof covering	Section	Maximum basic design wind speed, V < 140 mph	Maximum basic design wind speed, V ≥ 140 mph
Metal roof panels	1507.4	Manufacturer's instructions	ASTM D4869 Type IV
Metal roof shingles	1507.5	ASTM D226 Type I or II ASTM D4869 Type I, II, III or IV	ASTM D226 Type II ASTM D4869 Type IV
Mineral-surfaced roll roofing	1507.6	ASTM D226 Type I or II ASTM D4869 Type I, II, III or IV	ASTM D226 Type II ASTM D4869 Type IV
Slate shingles	1507.7	ASTM D226 Type II ASTM D4869 Type III or IV	ASTM D226 Type II ASTM D4869 Type IV
Wood shingles	1507.8	ASTM D226 Type I or II ASTM D4869 Type I, II, III or IV	ASTM D226 Type II ASTM D4869 Type IV
Wood shakes	1507.9	ASTM D226 Type I or II ASTM D4869 Type I, II, III or IV	ASTM D226 Type II ASTM D4869 Type IV
Photovoltaic shingles	1507.16	ASTM D226 Type I or II ASTM D4869 Type I, II, III or IV ASTM D6757	ASTM D226 Type II ASTM D4869 Type IV ASTM D6757

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ROOF ASSEMBLIES AND ROOFTOP STRUCTURES

**TABLE 1507.1.1(2)
UNDERLAYMENT APPLICATION**

ROOF COVERING	SECTION	MAXIMUM BASIC DESIGN WIND SPEED, V < 140 MPH	MAXIMUM BASIC DESIGN WIND SPEED, V ≥ 140 MPH
Asphalt shingles	1507.2	For roof slopes from 2 units vertical in 12 units horizontal (2:12), up to 4 units vertical in 12 units horizontal (4:12), underlayment shall be two layers applied as follows: Apply a 19-inch strip of underlayment felt parallel to and starting at the eaves. Starting at the eave, apply 36-inch-wide sheets of underlayment, overlapping successive sheets 19 inches. End laps shall be 4 inches and shall be offset by 6 feet. Distortions in the underlayment shall not interfere with the ability of the shingles to seal. For roof slopes of 4 units vertical in 12 units horizontal (4:12) or greater, underlayment shall be one layer applied as follows: Underlayment shall be applied shingle fashion, parallel to and starting from the eave and lapped 2 inches. Distortions in the underlayment shall not interfere with the ability of the shingles to seal. End laps shall be 4 inches and shall be offset by 6 feet.	Same as Maximum Basic Design Wind Speed, V < 140 mph except all laps shall be not less than 4 inches
Metal roof panels	1507.4	Apply in accordance with the manufacturer's installation instructions	For roof slopes from 2 units vertical in 12 units horizontal (2:12), up to 4 units vertical in 12 units horizontal (4:12), underlayment shall be two layers applied as follows: Apply a 19-inch strip of underlayment felt parallel to and starting at the eaves. Starting at the eave, apply 36-inch-wide sheets of underlayment, overlapping successive sheets 19 inches. End laps shall be 4 inches and shall be offset by 6 feet. For roof slopes of 4 units vertical in 12 units horizontal (4:12) or greater, underlayment shall be one layer applied as follows: Underlayment shall be applied shingle fashion, parallel to and starting from the eave and lapped 2 inches. Distortions in the underlayment shall not interfere with the ability of the shingles to seal. End laps shall be 4 inches and shall be offset by 6 feet.
Metal roof shingles	1507.5		
Manufactured roll roofing	1507.6		
Slate shingles	1507.7		
Wood shingles	1507.8		
Wood shakes	1507.9	For roof slopes from 3 units vertical in 12 units horizontal (3:12), up to 4 units vertical in 12 units horizontal (4:12), underlayment shall be two layers applied as follows: Apply a 19-inch strip of underlayment felt parallel to and starting at the eaves. Starting at the eave, apply 36-inch-wide sheets of underlayment, overlapping successive sheets 19 inches. End laps shall be 4 inches and shall be offset by 6 feet. Distortions in the underlayment shall not interfere with the ability of the shingles to seal. For roof slopes of 4 units vertical in 12 units horizontal (4:12) or greater, underlayment shall be one layer applied as follows: Underlayment shall be applied shingle fashion, parallel to and starting from the eave and lapped 2 inches. Distortions in the underlayment shall not interfere with the ability of the shingles to seal. End laps shall be 4 inches and shall be offset by 6 feet.	Same as Maximum Basic Design Wind Speed, V < 140 mph except all laps shall be not less than 4 inches
Photovoltaic shingles	1507.16		

For SI: 1 inch = 25.4 mm; 1 foot = 304.8 mm; 1 mile per hour = 0.447 m/s.

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ROOF ASSEMBLIES AND ROOFTOP STRUCTURES

**TABLE 1507.1.1(3)
UNDERLAYMENT ATTACHMENT**

ROOF COVERING	SECTION	MAXIMUM BASIC DESIGN WIND SPEED, V < 140 MPH	MAXIMUM BASIC DESIGN WIND SPEED, V ≥ 140 MPH
Asphalt shingles	1507.2	Fastened sufficiently to hold in place	The underlayment shall be attached with corrosion-resistant fasteners in a grid pattern of 12 inches between side laps with a 6-inch spacing at side and end laps. Underlayment shall be attached using metal or plastic cap nails or cap staples with a nominal cap diameter of not less than 1 inch. Metal caps shall have a thickness of not less than 32-gage (0.0134 inch) sheet metal. Power-driven metal caps shall have a minimum thickness of 0.010 inch. Minimum thickness of the outside edge of plastic caps shall be 0.035 inch. The cap nail shank shall be not less than 0.083 inch for ring shank cap nails and 0.091 inch for smooth shank cap nails. Staples shall be not less than 21 gage (0.032 inch). The cap nail shank and cap staple legs shall have a length sufficient to penetrate through the roof sheathing or not less than 3/4 inch into the roof sheathing.
Clay and concrete tile	1507.3		
Photovoltaic shingles	1507.16		

For SI: 1 inch = 25.4 mm; 1 mile per hour = 0.447 m/s.

1507.3 Asphalt shingles. The installation of asphalt shingles shall comply with the provisions of this section.

1507.2.1 Deck requirements. Asphalt shingles shall be fastened to solidly sheathed decks.

1507.2.2 Slope. Asphalt shingles shall only be used on roof slopes of 3 units vertical in 12 units horizontal (17-percent slope) or greater. For roof slopes from 2 units vertical in 12 units horizontal (17-percent slope) up to 4 units vertical in 12 units horizontal (23-percent slope), double underlayment application is required in accordance with Section 1507.1.

1507.2.3 Underlayment. Underlayment shall comply with Section 1507.1.1.

1507.2.4 Asphalt shingles. Asphalt shingles shall comply with ASTM D3463.

1507.2.5 Fasteners. Fasteners for asphalt shingles shall be galvanized, stainless steel, aluminum or copper roofing nails, minimum 1 1/8-inch (31.8 mm) diameter (2.67 mm) shank with a minimum 3/8-inch diameter (9.5 mm) head, of a length to penetrate through the roofing materials and not less than 3/8 inch (9.5 mm) into the roof sheathing. Where the roof sheathing is less than 3/8 inch (9.5 mm) thick, the nails shall penetrate through the sheathing. Fasteners shall comply with ASTM F1667.

1507.2.6 Attachment. Asphalt shingles shall have the minimum number of fasteners required by the manufacturer, but not less than four fasteners per strip shingle or two fasteners per individual shingle. Where the roof slope exceeds 21 units vertical in 12 units horizontal (21:12), shingles shall be installed as required by the manufacturer.

1507.2.7 Ice barrier. Where required, ice barriers shall comply with Section 1507.1.2.

1507.2.8 Flashings. Flashing for asphalt shingles shall comply with this section. Flashing shall be applied in accordance with this section and the asphalt shingle manufacturer's printed instructions.

1507.2.8.1 Base and cap flashing. Base and cap flashing shall be installed in accordance with the manufacturer's instructions. Base flashing shall be of either corrosion-resistant metal of minimum nominal 0.019-inch (0.483 mm) thickness or mineral-surfaced roll roofing weighing not less than 77 pounds per 100 square feet (3.76 kg/m²). Cap flashing shall be corrosion-resistant metal of minimum nominal 0.019-inch (0.483 mm) thickness.

1507.2.8.2 Valleys. Valley linings shall be installed in accordance with the manufacturer's instructions before applying shingles. Valley linings of the following types shall be permitted:

- For open valleys (valley lining exposed) lined with metal, the valley lining shall be not less than 24 inches (610 mm) wide and of any of

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ROOF ASSEMBLIES AND ROOFTOP STRUCTURES

shingles shall conform to the applicable standards listed in this chapter. Underlayment materials required to comply with ASTM D226, D1970, D4869 and D6757 shall bear a label indicating compliance with the standard designation and, if applicable, type classification indicated in Table 1507.1.1(1). Underlayment shall be applied in accordance with Table 1507.1.1(2). Underlayment shall be attached in accordance with Table 1507.1.1(3).

Exceptions:

- As an alternative, a minimum 4-inch-wide (102 mm) strip of self-adhering polymer modified bitumen membrane complying with ASTM D1970 and installed in accordance with the manufacturer's installation instructions for the deck material shall be applied over all joints in the roof decking. An approved underlayment for the applicable roof covering for design wind speeds less than 120 mph (54 m/s) shall be applied over the 4-inch-wide (102 mm) membrane strips.

shall be 4 inches (102 mm) and shall be offset by 6 feet (1829 mm). Underlayment shall be attached using metal or plastic cap nails with a nominal cap diameter of not less than 1 inch (25.4 mm). Metal caps shall have a thickness of not less than 32-gage sheet metal. Power-driven metal caps shall have a thickness of not less than 0.010 inch (0.254 mm). Thickness of the outside edge of plastic caps shall be not less than 0.035 inch (0.89 mm). The cap nail shank shall be not less than 0.083 inch (2.1 mm) for ring shank cap nails and 0.091 inch (2.3 mm) for smooth shank cap nails. The cap nail shank shall have a length sufficient to penetrate through the roof sheathing or not less than 3/4 inch (19.1 mm) into the roof sheathing.

- Structural metal panels that do not require a substrate or underlayment.

1507.1.2 Ice barriers. In areas where there has been a history of ice forming along the eaves causing a backup of water, an ice barrier shall be installed for asphalt shingles, metal roof shingles, mineral-surfaced roll roofing, slate and slate-type shingles, wood shingles, and wood shakes. The ice barrier shall consist of not less than two layers of underlayment cemented together, or a self-adhering polymer modified bitumen sheet shall be used in place of normal underlayment and extend from the lowest edge of all roof surfaces to a point not less than 24 inches (610 mm) inside the exterior wall line of the building.

Exception: Detached accessory structures that do not contain conditioned floor area.

ROOF COVERING	SECTION	MINIMUM BASIC DESIGN WIND SPEED, v < 140 MPH	MAXIMUM BASIC DESIGN WIND SPEED, v ≥ 140 MPH
Asphalt shingles	1507.2	ASTM D226 Type I or II	ASTM D226 Type II
		ASTM D4869 Type I, II, III or IV	ASTM D4869 Type IV
Clay and concrete tiles	1507.3	ASTM D6757	ASTM D6757
		ASTM D226 Type II	ASTM D226 Type II
Metal roof panels	1507.4	ASTM D2626 Type I	ASTM D2626 Type I
		ASTM D6380 Class M mineral-surfaced roll roofing	ASTM D6380 Class M mineral-surfaced roll roofing
Metal roof shingles	1507.5	Manufacturer's instructions	ASTM D226 Type II
		ASTM D226 Type I or II	ASTM D4869 Type IV
Mineral-surfaced roll roofing	1507.6	ASTM D226 Type I or II	ASTM D226 Type II
		ASTM D4869 Type I, II, III or IV	ASTM D4869 Type IV
Slate shingles	1507.7	ASTM D226 Type I or II	ASTM D226 Type II
		ASTM D4869 Type III or IV	ASTM D4869 Type IV
Wood shingles	1507.8	ASTM D226 Type I or II	ASTM D226 Type II
		ASTM D4869 Type I, II, III or IV	ASTM D4869 Type IV
Wood shakes	1507.9	ASTM D226 Type I or II	ASTM D226 Type II
		ASTM D4869 Type I, II, III or IV	ASTM D4869 Type IV
Photovoltaic shingles	1507.16	ASTM D226 Type I or II	ASTM D226 Type II
		ASTM D4869 Type I, II, III or IV	ASTM D4869 Type IV

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ROOF ASSEMBLIES AND ROOFTOP STRUCTURES

shingles shall conform to the applicable standards listed in this chapter. Underlayment materials required to comply with ASTM D226, D1970, D4869 and D6757 shall bear a label indicating compliance with the standard designation and, if applicable, type classification indicated in Table 1507.1.1(1). Underlayment shall be applied in accordance with Table 1507.1.1(2). Underlayment shall be attached in accordance with Table 1507.1.1(3).

Exceptions:

- As an alternative, a minimum 4-inch-wide (102 mm) strip of self-adhering polymer modified bitumen membrane complying with ASTM D1970 and installed in accordance with the manufacturer's installation instructions for the deck material shall be applied over all joints in the roof decking. An approved underlayment for the applicable roof covering for design wind speeds less than 120 mph (54 m/s) shall be applied over the 4-inch-wide (102 mm) membrane strips.

- As an alternative, two layers of underlayment complying with ASTM D226 Type II or ASTM D4869 Type IV shall be permitted to be installed as follows: Apply a 19-inch (483 mm) strip of underlayment parallel with the eave. Starting at the eave, apply 36-inch-wide (914 mm) strips of underlayment felt, overlapping successive sheets 19 inches (483 mm). The underlayment shall be attached with corrosion-resistant fasteners in a grid pattern of 12 inches (305 mm) between side laps with a 6-inch (152 mm) spacing at side and end laps. End laps

shall be 4 inches (102 mm) and shall be offset by 6 feet (1829 mm). Underlayment shall be attached using metal or plastic cap nails with a nominal cap diameter of not less than 1 inch (25.4 mm). Metal caps shall have a thickness of not less than 32-gage sheet metal. Power-driven metal caps shall have a thickness of not less than 0.010 inch (0.254 mm). Thickness of the outside edge of plastic caps shall be not less than 0.035 inch (0.89 mm). The cap nail shank shall be not less than 0.083 inch (2.1 mm) for ring shank cap nails and 0.091 inch (2.3 mm) for smooth shank cap nails. The cap nail shank shall have a length sufficient to penetrate through the roof sheathing or not less than 3/4 inch (19.1 mm) into the roof sheathing.

ROOF COVERING	SECTION	MINIMUM BASIC DESIGN WIND SPEED, v < 140 MPH	MAXIMUM BASIC DESIGN WIND SPEED, v ≥ 140 MPH
Asphalt shingles	1507.2	ASTM D226 Type I or II	ASTM D226 Type II
		ASTM D4869 Type I, II, III or IV	ASTM D4869 Type IV
Clay and concrete tiles	1507.3	ASTM D6757	ASTM D6757
		ASTM D226 Type II	ASTM D226 Type II
Metal roof panels	1507.4	Manufacturer's instructions	ASTM D226 Type II
		ASTM D226 Type I or II	ASTM D4869 Type IV
Metal roof shingles	1507.5	ASTM D226 Type I or II	ASTM D226 Type II
		ASTM D4869 Type I, II, III or IV	ASTM D4869 Type IV
Mineral-surfaced roll roofing	1507.6	ASTM D226 Type I or II	ASTM D226 Type II
		ASTM D4869 Type I, II, III or IV	ASTM D4869 Type IV
Slate shingles	1507.7	ASTM D226 Type I or II	ASTM D226 Type II
		ASTM D4869 Type III or IV	ASTM D4869 Type IV
Wood shingles	1507.8	ASTM D226 Type I or II	ASTM D226 Type II
		ASTM D4869 Type I, II, III or IV	ASTM D4869 Type IV
Wood shakes	1507.9	ASTM D226 Type I or II	ASTM D226 Type II
		ASTM D4869 Type I, II, III or IV	ASTM D4869 Type IV
Photovoltaic shingles	1507.16	ASTM D226 Type I or II	ASTM D226 Type II
		ASTM D4869 Type I, II, III or IV	ASTM D4869 Type IV

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ROOF ASSEMBLIES AND ROOFTOP STRUCTURES

shingles shall conform to the applicable standards listed in this chapter. Underlayment materials required to comply with ASTM D226, D1970, D4869 and D4577 shall bear a label indicating compliance with the standard designation and, if applicable, type classification indicated in Table 1507.1.1(1). Underlayment shall be applied in accordance with Table 1507.1.1(2). Underlayment shall be attached in accordance with Table 1507.1.1(3).

Exceptions:

1. As an alternative, a minimum 4-inch-wide (102 mm) strip of self-adhering polymer modified bitumen membrane complying with ASTM D1970 and installed in accordance with the manufacturer's installation instructions for the deck material shall be applied over all joints in the roof decking. An approved underlayment for the applicable roof covering for design wind speeds less than 120 mph (54 m/s) shall be applied over the 4-inch-wide (102 mm) membrane strips.
2. As an alternative, two layers of underlayment complying with ASTM D226 Type II or ASTM D4869 Type IV shall be permitted to be installed as follows: Apply a 19-inch (483 mm) strip of underlayment parallel with the eave. Starting at the eave, apply 36-inch-wide (914 mm) strips of underlayment felt, overlapping successive sheets 19 inches (483 mm). The underlayment shall be attached with corrosion-resistant fasteners in a grid pattern of 12 inches (305 mm) between side laps with a 6-inch (152 mm) spacing at side and end laps. End laps shall be 4 inches (102 mm) and shall be offset by 6 feet (1829 mm). Underlayment shall be attached using metal or plastic cap nails with a nominal cap diameter of not less than 1 inch (25.4 mm). Metal caps shall have a thickness of not less than 32-gauge sheet metal. Power-driven metal caps shall have a thickness of not less than 0.010 inch (0.254 mm). Thickness of the outside edge of plastic caps shall be not less than 0.035 inch (0.89 mm). The cap nail shank shall be not less than 0.083 inch (2.1 mm) for ring shank cap nails and 0.091 inch (2.3 mm) for smooth shank cap nails. The cap nail shank shall have a length sufficient to penetrate through the roof sheathing or not less than 1/2 inch (12.7 mm) into the roof sheathing.
3. Structural metal panels that do not require a substrate or underlayment.

1507.1.2 Ice barriers. In areas where there has been a history of ice forming along the eaves causing a backup of water, an ice barrier shall be installed for asphalt shingles, metal roof shingles, mineral-surfaced roll roofing, slate and slate-type shingles, wood shingles, and wood shakes. The ice barrier shall consist of not less than two layers of underlayment cemented together, or a self-adhering polymer modified bitumen sheet shall be used in place of normal underlayment and extend from the lowest edges of all roof surfaces to a point not less than 24 inches (610 mm) inside the exterior wall line of the building.


Exception: Detached accessory structures that do not contain conditioned floor area.

ROOF COVERING	SECTION	MINIMUM WIND SPEED	UNDERLAYMENT
Asphalt shingles	1507.2	ASTM D226 ASTM D4869 ASTM D4577	ASTM D226 Type II or III ASTM D4869 Type I, II, III or IV ASTM D4577
Clay and concrete tiles	1507.3	ASTM D226 ASTM D4869 mineral surf	ASTM D226 Type II ASTM D4869 Type I, II, III or IV mineral surf
Metal roof panels	1507.4	Manufacturers	Manufacturers
Metal roof shingles	1507.5	ASTM D1970 ASTM D4869 Type I, II, III or IV	ASTM D1970 ASTM D4869 Type IV
Mineral-surfaced roll roofing	1507.6	ASTM D226 Type I or II ASTM D4869 Type I, II, III or IV	ASTM D226 Type II ASTM D4869 Type IV
Slate shingles	1507.7	ASTM D226 Type II ASTM D4869 Type III or IV	ASTM D226 Type II ASTM D4869 Type IV
Wood shingles	1507.8	ASTM D226 Type I or II ASTM D4869 Type I, II, III or IV	ASTM D226 Type II ASTM D4869 Type IV
Wood shakes	1507.9	ASTM D226 Type I or II ASTM D4869 Type I, II, III or IV	ASTM D226 Type II ASTM D4869 Type IV
Photovoltaic shingles	1507.16	ASTM D226 Type I or II ASTM D4869 Type I, II, III or IV ASTM D4577	ASTM D226 Type II ASTM D4869 Type IV ASTM D4577

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RESEARCH+TECH



Understanding underlayment
Did you know I-Codes require enhanced underlayment in high-wind regions?
by Mark S. Graham

Professional Roofing
May 2023

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QualityMark™ Program

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QualityMark™ Program

The QualityMark Program is a voluntary program for Canadian and U.S. manufacturers of polyisocyanurate roof insulation (ASTM C1289, Type II, Class I, Grade 2 and/or CAN/ULC-5704.1, Type 1, 2, or 3). The program enables participants to obtain third-party certification of long-term thermal resistance (LTTR) values for insulation products independently selected from manufacturing locations. Additionally, the program provides third-party verification of thermal resistance values (R-values) obtained in accordance with the ASTM C518 standard for full thickness products independently selected from distribution locations. Polyiso is the only insulation product to publish certified LTTR values.

FREQUENTLY ASKED QUESTIONS


Program Participants

Polyiso manufacturers that participate in the QualityMark Program include:

- Atlas Roofing Corporation
- Carlisle Construction Materials
- GAF
- Holcim Building Envelope
- IKO
- Johns Manville
- SOPREMA

PIMA recommends contacting the individual polyiso manufacturers for information on published QualityMark LTTR-values. [Link](#)


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 Arlington, VA 22201
 703.298.0093
www.polyiso.org

QualityMark™ Program Quarterly Conformance Report
 Reporting Period: Q4 2022 (October – December 2022)
 Last updated on July 3, 2023

About:
 The QualityMark Program is a voluntary program for manufacturers of polyisocyanurate roof insulation in the United States and Canada. The program enables participants to obtain third-party certification of long-term thermal resistance (LTTR) values for insulation products independently selected from manufacturing locations. Additionally, the program provides third-party verification of thermal resistance values (R-values) tested in accordance with the ASTM C518 standard for full thickness products independently selected from



LTTR-value Certification for Products Selected from Manufacturing Locations:
 Samples for LTTR-value certification are selected from manufacturing locations by independent third parties. The testing is performed by approved laboratories to obtain LTTR-values for 2.0", 3.0", and 4.0" product. Participating manufacturers are required to obtain an initial certification for each manufacturing location, which are then recertified every 3 years. The certification is used to validate the LTTR-values published by participating manufacturers.

R-value Verification for Products Selected from Distribution:
 Samples for R-value verification (ASTM C518) are selected on a quarterly basis from distribution locations by an independent third party. A sample is selected for each participating manufacturing location. After selection, the samples are held at laboratory conditions and tested at full thickness 180-days after the date of manufacture. A manufacturing location is deemed to conform to the program requirements when the measured R-value at 180-days is equal to or greater than the published LTTR-value for the product at the same labeled thickness. Manufacturing locations that receive non-conforming R-value verification results in consecutive quarters (inclusive of the current reporting period) are not in compliance with the program requirements.

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QualityMark Program Quarterly Conformance Report ¹ Reporting Period: Q4 2022 (October – December 2022)		
Manufacturing Location		Manufacturer
City	State/Province	
High River*	Alberta	IKO Industries Ltd.
Phoenix	Arizona	Atlas Roofing Corporation
Vancouver	British Columbia	Atlas Roofing Corporation
Northglenn	Colorado	Atlas Roofing Corporation
Bristol	Connecticut	Holcim Building Envelope
Jacksonville	Florida	Holcim Building Envelope
Jacksonville	Florida	Johns Manville
Lake City	Florida	Carlisle Construction Materials
LaGrange	Georgia	Atlas Roofing Corporation
Statesboro	Georgia	GAF
Florence	Kentucky	Holcim Building Envelope
East Moline	Illinois	Atlas Roofing Corporation
Franklin Park	Illinois	Carlisle Construction Materials
Fernley	Nevada	Johns Manville
Montgomery	New York	Carlisle Construction Materials
Brampton*	Ontario	IKO Industries Ltd.
Cornwall	Ontario	Johns Manville
Toronto	Ontario	Atlas Roofing Corporation
Camp Hill	Pennsylvania	Atlas Roofing Corporation
Hazleton	Pennsylvania	Johns Manville
New Columbia	Pennsylvania	GAF
Smithfield	Pennsylvania	Carlisle Construction Materials
Youngwood	Pennsylvania	Holcim Building Envelope
Drummondville	Quebec	SOPREMA
Corsicana	Texas	Holcim Building Envelope
Diboll	Texas	Atlas Roofing Corporation
Gainesville	Texas	GAF
Terrell	Texas	Carlisle Construction Materials
Cedar City	Utah	GAF
Tooele	Utah	Carlisle Construction Materials
Puyallup	Washington	Carlisle Construction Materials

Last updated on July 3, 2023. Current report available at www.polyiso.org/QUALITYMARK.

¹This manufacturing location has a pending result for its LTTR-value certification. The table above will be periodically updated as LTTR-value certifications are completed.

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Table Note 1:
The manufacturing locations listed below have recently been brought on-line. The time represented by the current reporting period was prior to the date the location either started commercial production or completed its initial LTTR-value certification. Results for these plants will be included in future reporting periods.

- Hagerstown, Maryland – IKO Industries Ltd.
- Hillsboro, Texas – Johns Manville
- Sikeston, Missouri – Carlisle Construction Materials

Questions:
For questions regarding the QualityMark Program, please contact PIMA using the "Contact Us" form on the website [here](#).

Page 3 of 3


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Recommendations

- Watch for updates to PIMA’s Quarterly Conformance Report
- Consider asking polyiso. manufacturers to certify their current compliance
- Be careful to represent/sell insulation on its thickness, not by its R-value

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RESEARCH+TECH



Updating PIMA's QualityMarkSM
Revisions provide increased credibility
by Mark S. Graham

The Polyisocyanurate Insulation Manufacturers Association recently updated its QualityMark program, which has been in existence since 2004 and addresses the long-term thermal resistances of polyisocyanurate insulation used in low-slope roof systems.

What it is
PIMA's QualityMark is a voluntary program for manufacturers of rigid board polyisocyanurate roof insulation manufactured in the U.S. and Canada. The program allows manufacturers to obtain and use third-party certification of long-term thermal resistance values, commonly referred to as LTR, for their products. Additionally, the program provides third-party verification of R-values.

The following polyisocyanurate insulation manufacturers participate in the program:

- Atlas Roofing Corp., Meridian, Miss.
- Carlisle Construction Materials, Carlisle, Pa.
- GAF Parsippany-Troy Hills, N.J.
- Holcim Building Envelope, Nashville, Tenn.

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Fastener concerns

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RoofNav

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Search Criteria

Found: 7

- Trade Name
- 2-3/8" Bar
- 3" WW Ins
- 3" BE Insu
- ACE #12
- ACE #15
- ACE-FS12
- ACE-FS15

Product Detail Report

Company: Ace Screws LLC
 Trade Name: ACE #15
 Document Link: none
 Comments: Model Name - ACE-FS15-INS, ACE-FS15-INB Length Range 1-1/4", 2", 3", 4", 5", 6", 7", 8", 9", 10", 11", 12", 14", 16", 18", 20", 22", 24"

Approved Uses

Fastening (Fastener)

Material:	steel
Fastener Type:	screw, self drilling
Fastener Coating:	(see comments)
Drive Head:	truss head (full contour) w/ #3 Phillips recess
Fastener Diameter:	0.1575 in
Min Length:	1.2500 in
Max Length:	14.0000 in
Steel Deck Fastener:	No
Structure Min Thickness:	0.0000 in
Structure Max Thickness:	0.0000 in
Max Deck Design Thickness:	0.0000 in
Comments:	R437 anti-corrosion treatment Length Range 1-1/4", 2", 3", 4", 5", 6", 7", 8", 9", 10", 11", 12", 14", 16", 18", 20", 22", 24"

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Some considerations

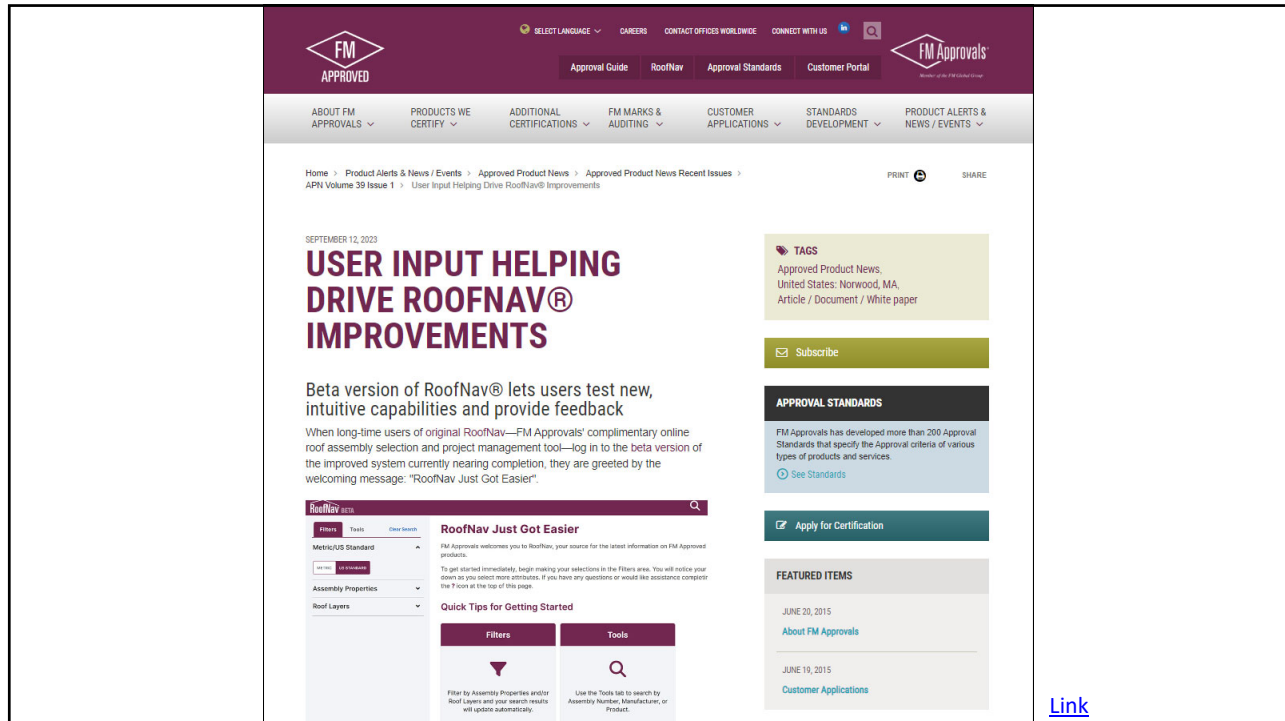
Fastener concerns

- Purchase membrane and insulation fasteners supplied by the roof system manufacturer
- Listen to feedback from your field applicators
- Contact NRCA Technical Services with questions or concerns

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FM Approvals' RoofNav -- New Beta test version

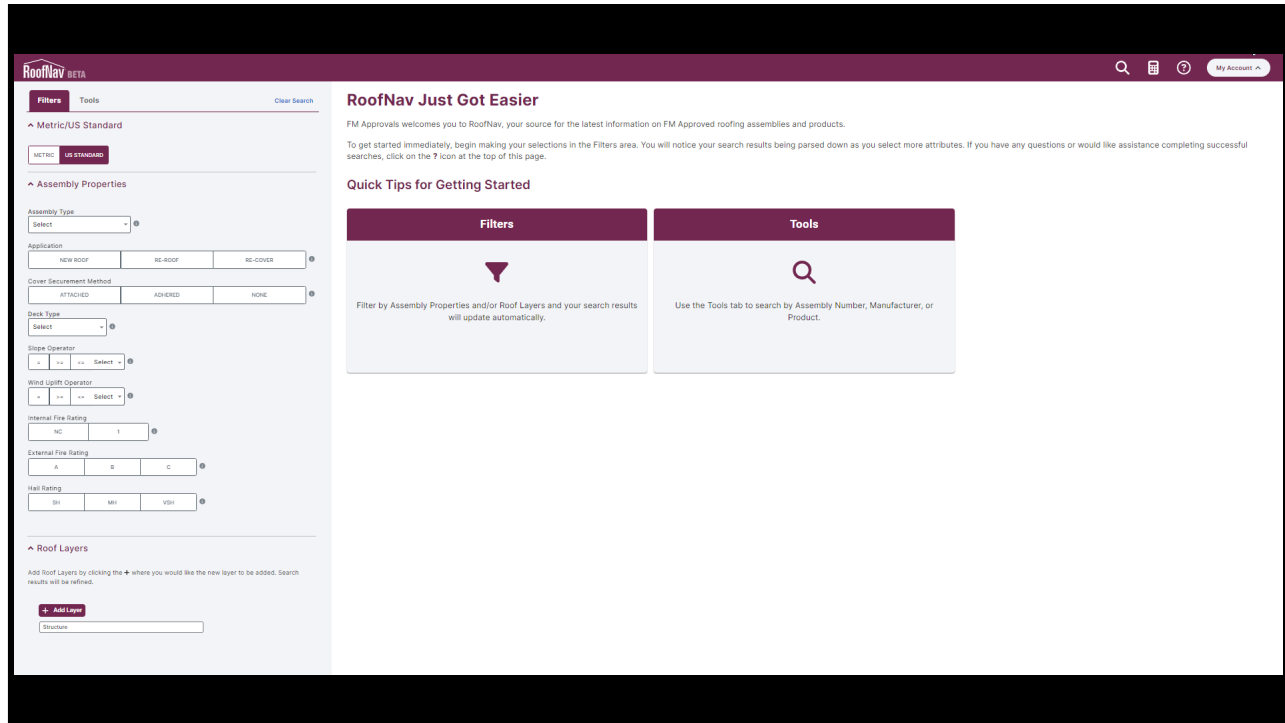
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What we tested...

Vapor retarder adhesion testing

- 2-ply asphalt BUR membrane
- Manufacturer A-SA vapor retarder
- Manufacturer B-SA vapor retarder
- Manufacturer C-SA vapor retarder
- Manufacturer D-SA vapor retarder

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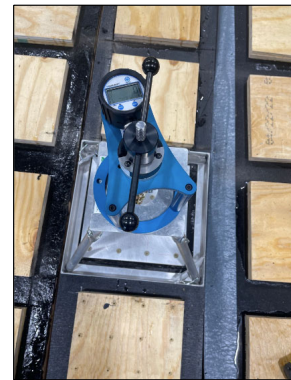
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Sample conditioning

After vapor retarder application; 28 days after concrete placement

- Conditioned for 60-days
- One set of each at standard laboratory conditions
- Other set of each at a 30 F temperature differential
 - The temperature differential creates an upward vapor pressure drive

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Test results

Vapor retarder adhesion

Sample	Tested pull resistance		Difference	
	Lab. conditions 60-day conditioning (Average of 5 specimens)	Vapor drive 60-day conditioning (Average of 5 specimens)	Differential	Percent differential
2-ply built-up membrane	1,421 psf	833 psf	-588 psf	-41%

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Conclusions

Vapor retarder adhesion

- Results vary
- For 4 of 5 samples, vapor drive conditioning resulted in lower values, but Manufacture 3-SA VR is higher
- All results greater than 90 psf (i.e., FM 1-90)

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Recommendations

Vapor retarder adhesion

- Designers should specify vapor retarders after considering vapor retarder adhesion both at the time of application and in-service.
- Manufacturers should incorporate some form of vapor drive conditioning assessment in their product development and assessment, and make that information available to specifiers.
- The vapor drive conditioning used in this testing is one possible assessment method.

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RESEARCH+TECH



Better understanding of adhesion

Recent research shows vapor retarder adhesion to new concrete roof decks varies

by Mark S. Graham

is "An evolution of knowledge." February 2022 issue. I discussed NRCIA's research examining roofing-related problems with moisture in concrete roof decks. One area where NRCIA considered additional research to be necessary was addressing the adequacy of vapor retarder adhesion to newly placed concrete roof decks. NRCIA has since undertaken this research, which provides designers with some guidance for proper vapor retarder selection.

Adhesion research
NRCIA contracted with SRI Consultants Inc., Waukesha, Wis., to oversee test specimen preparation and conduct vapor retarder adhesion testing. For 6-inch-thick concrete roof deck specimens, they were poured using normal-weight structural concrete. The top surface of the concrete specimens were flat finished. After 28 days of curing at standard laboratory conditions, a two-ply built-up membrane was applied to two of the concrete roof deck specimens and four different manufacturers' self-adhering vapor retarder products were applied to the remaining concrete roof deck specimens in two specimens sets. For each of the self-adhering vapor retarder types, the manufacturer's recommended primer was used, and installation

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