

PORTERVILLE UNIFIED SCHOOL DISTRICT

Creating Opportunities: Changing Lives

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TOM VELASQUEZ
Member

School Site Address; 465 W Olive Ave, Porterville, Ca 93257

Job Walk: **April 29, 2022 @ 10:00AM, Meet in front of School.**

Bids Due: ~~May 6, 2022 @ 3:00 PM~~ **May 13, 2022 3:00PM.**

Anticipated Start date if approved **June 13, 2022**

All bids are to be submitted via Vendor Registry @3:00PM.

Mandatory Job Walk!

ROOFING REPLACEMENT AT PORTERVILLE HIGH SCHOOL MINI GYM, WEST CLASSROOM, ADMIN OFFICE, AND BUILDINGS M,K,T,U.

ADDENDUM #2 RFI RESPONSES, REVISED BID FORM, AND ROOFING SHINGLE CUT SHEETS .

RFI RESPONSES.

1. Will you be extending the bid date one week to Friday, May 13th? **That is correct bids are due May 13th,2022 at 3:00pm via vendor registry.**
2. Will you be furnishing an asbestos report for all the buildings? **Asbestos report will be provided this week via Addendum. Cost to be included in bids.**
3. Will you have line items for plywood deck replacement? **No, work to be completed on a T&M basis once district ID the damaged plywood.**
4. Are you going to include an allowance for deck replacement? **See previous.**

GYMNASIUM BUILDING Item 01 Please confirm the following:

5. All electrical will be handled by Porterville USD (PUSD). **Electrical and plumbing will be handled by PUSD. If conduits plumbing pipes are on deck, it is the contractor responsibility to work around them.**
6. PUSD will install sheet metal covers on the mini gym. **Yes.**
7. PUSD will furnish a new ridge vent to replace damaged vent on the mini gym. **CONTRACTORS RESPONSIBILITY**
8. Item 03 Please confirm the entry canopy over the girls locker is to be included in the bid. **Yes, canopy cover over girl's locker shall be included in the contract price.**

9. Item 04 per the job walk, the existing counter flashing on the wall over the mini gym will be cutback to install new roofing and a new sheet metal skirt flashing installed. Please confirm. **Yes, that is correct. Contractor is responsible to make condition watertight.**
10. Item 05 Is the perimeter cap flashing over the fascia to be replaced with new? **Yes**
11. Item 06 Please confirm the leader heads and downspouts are to be replaced with new. **Leader heads are to be replaced with new ones. District will install 3" O.D metal downspouts after contract is completed.**
12. Item 07 Some of the equipment is too low. The manufacturer requires 8" clearance to install the base flashings. Please advise what you want done with all the equipment.? **Depending on condition, the district will raise curbs to 8" with HVAC vendor.**
13. Item 08 There is a short piece of expansion joint from the girls locker room to the gym building. Do you want a new sheet metal cover installed over it? **Yes, please provide sheet metal.**
14. Item 09 Is all the equipment on the barrel roof of the gym to be removed and reinstalled? **Yes.**
15. **ADMINISTRATION** Item 10 The coping on the main roof area has a metal panel fascia that carries over the wall. There is a two-piece flashing integrated under the fascia panel. Can we remove the skirt and remove as much roofing as possible and then run the roofing up the wall and reinstall the skirt flashing. **That is acceptable as long as system is water tight.**
16. Can the coping be fabricated in lieu of a premanufactured coping system? The coping can be made from a standard color chart of prefinished metal. **All roofing coping can be fabricated. All materials will need to match project specs.**
17. Item 12 Please confirm PUSD will remove and reinstall the large mechanical unit in the well area. A new platform will be installed and roofed in. Please advise who will handle building the new platform. **Units in well area will be removed to allow roofing to be removed and reinstalled. PUSD/ HVAC contractor will build new platform.**
18. Item 13 Some of the equipment is too low. The manufacturer requires 8" clearance to install the base flashings. Please advise what you want done with all the equipment. **Please see previous response.**
19. Item 14 Please confirm you want new Durablocks under the multiple conduits to match the existing layout. **Install per project specs.**
20. Item 15 Do you want new wood blocks and walkpads under the existing conduits? **Walk Pads Yes. Dura-blocks under existing conduits.**
21. Item 16 Do you want the existing term bar removed on the wall flashings to install a new surface mounted sheet metal flashing over the new base flashing? **Yes**
22. Item 17 We found a number of soft roof deck areas. Will you have a line item to replace the damaged roof deck with new to match existing or will it be on a time and material basis? **Once roofing material is removed PUSD will walk to the roof and determine what plywood needs to be replaced. Work will need to be completed on a Time and Material basis.**
23. Item 18 Are the heat stacks/flues to receive new sheet metal jacks? **YES**

CLASSROOM WING 'M' CLASSROOM WINGS 'K' 'T' & 'U' .

24. Item 19 Do you want new prefinished fascia metal on the rake sides? **YES**
25. Item 20 Do you want a price to replace any damaged 2x fascia? **YES**
26. Item 21 All of the equipment curbs need to have sheet metal saddles, apron & step flashings whether you install a metal roof system or composition shingles. Please confirm we are to include these items. **YES please include in proposal.**

27. Will you be coming out with an addendum that will include a request for the installation of composition shingles as an alternate to standing seam metal panels?
See attached.
28. Will we continue with the standing seam metal panel as you have in your bid documents? **District will need to review cost.**
29. The specs contain "Roof Accessories" are we supposed to provide and install new roof hatches wherever they are existing? **Yes, that is correct.**

BID FORM

ROOFING REPLACEMENT AT PORTERVILLE HIGH SCHOOL MINI GYM & WEST CLASSROOM

Porterville Unified School District
600 W Grand Ave
Porterville, Ca 93257

The undersigned doing business under the firm name of:

_____ hereby propose and agree to enter into a Contract, to furnish any and all labor, materials, applicable taxes, equipment and services for the completion of Work described hereinafter and in the Contract Documents:

ROOFING REPLACEMENT AT PORTEVILLE HIGH SCHOOL MINI GYM, WEST CLASSROOM, ADMIN OFFICE, AND BUILDINGS M, K, T, U.

SCOPE OF WORK PER SITE:

**PORTERVILLE HIGH SCHOOL
465 W OLIVE AVE
PORTERVILLE, CA 93257:**

Basis of award will be low bidder on base bid.

= **Base Bid** _____ Dollars (\$ _____)

Alternate Price for Shingle Roofing In lieu of Metal Roof system at Buildings M, K, T, and U. Per attached cut sheets.

=Alternate price _____ Dollars (\$ _____)

If written notice of the Award of Contract is mailed, faxed, or delivered to the undersigned at any time before this bid is withdrawn, the undersigned shall, within ten (10) days after the date of such mailing, faxing, or delivering of such notice, execute and deliver an agreement in the form of agreement present in these Contract Documents and give Performance and Payment Bonds in accordance with the specifications and bid as accepted.

The undersigned hereby designates as the office to which such Notice of Award of Contract may be mailed, telegraphed, or delivered:

Our Public Liability and Property Damage Insurance is placed with:

Our Workers' Compensation Insurance is placed with:

Circular letters, bulletins, addenda, etc., bound with the specifications or issued during the time of bidding are included in the bid, and, in completing the Contract, they are to become a part thereof.

The receipt of the following addenda to the specifications is acknowledged:

Addendum No. _____ Date _____	Addendum No. _____ Date _____
Addendum No. _____ Date _____	Addendum No. _____ Date _____
Addendum No. _____ Date _____	Addendum No. _____ Date _____

This bid may be withdrawn at any time prior to the scheduled time for the opening of bids or any authorized postponement thereof.

A bidder shall not submit a bid unless the bidder's contractor's license number appears clearly on the bid, the license expiration date and class are stated, and the bid contains a statement that the representations made therein are made under penalty of perjury. Any bid submitted by a contractor who is not licensed pursuant to Business and Professions Code section 7028.15 shall be considered nonresponsive and shall be rejected. Any bid not containing the above information, or a bid containing information which is subsequently proven false, may be considered nonresponsive and may be rejected.

NOTE: Each bid must give the full business address of the bidder and be signed by bidder with bidder's usual signature. Bids by partnerships must furnish the full name of all partners and must be signed in the partnership name by a general partner with authority to bind the partnership in such matters, followed by the signature and designation of the person signing. The name of the person signing shall also be typed or printed below the signature. Bids by corporations must be signed with the legal name of the corporation, followed by the name of the state of incorporation and by the signature and designation of the chairman of the board, president or any vice president, and then followed by a second signature by the secretary, assistant secretary, the chief financial officer or assistant treasurer. All persons signing must be authorized to bind the corporation in the matter. The name of each person signing shall also be typed or printed below the signature. Satisfactory evidence of the authority of the officer signing on behalf of a corporation shall be furnished.

The undersigned declares under penalty of perjury under the laws of the State of California that the representations made in this bid are true and correct.

Print or Type Name _____

Title _____
Name of Company as Licensed _____
Business Address _____
Telephone Number _____
Contractor License No. _____
Class and Expiration Date _____
State of Incorporation, if Applicable _____

() Evidence of authority to bind corporation is attached.

Dated: _____, _____

Signed _____

TECHNICAL DETAILS

WEIGHT/SQUARE 275 lbs. 124.8 kg	EXPOSURE 5 ⁵ / ₈ " 142.9 mm
SHINGLES/SQUARE 64 4 bundles/square	GRANULE ADHESION 0.35 g Typical Results
WIDTH ± 1/8" 13 ¹ / ₄ " 337 mm	LENGTH ± 1/4" 40" 1.02 m
SQUARES/PALLET 12	

TEST COMPLIANCE

ASTM D7158 Class H	ASTM D3462
ASTM D3161 Class F	ASTM D3018 Type I
ASTM E108 Class A Fire Rating	UL RATING 2218 Class 4
CSA A123.5	ICC APPROVAL ESR-3150
FBC APPROVAL #14809	
	
CEC Title 24, Part 6 Compliant	

See page 2 for solar reflectance technical data.

FEATURES & BENEFITS

- Solar Reflective Shingles
- Scotchgard™ Protection from 3M
- Extreme Weather Protection
- Superior Granular Embedment
- Flexor™ SBS Polymer Modified Asphalt
- The Zone® Nailing Area
- All-Weather Flexibility
- Double Rain Seal Protection
- Limited Lifetime Shingle Warranty
- Limited & Enhanced Wind Warranties

FLEXOR™ SBS POLYMER MODIFIED LAMINATED SOLAR REFLECTIVE SHINGLES



PRODUCT USE

Ecoasis™ Premium is a solar reflective, laminated asphalt shingle used whenever increased flexibility, architectural design, tensile strength, and tear-resistance in shingles is desired. It is fortified with Flexor™ SBS polymer modified asphalt technology for extreme weather protection and includes the Scotchgard™ Algae Resistant Shingle Protector warranty from 3M. Ecoasis™ Premium features the exclusive nailing accuracy-enhancing design of The Zone®. The larger nailing area of The Zone® dramatically improves correct fastener placement. Ecoasis™ Premium shingles meet the required reflectance to be designated with some of the industry's leading energy conservation standards: ENERGY STAR, CRRC listing, and California Energy Code Title 24, Part 6 compliance. Please consult Malarkey's Technical Services Department for approval of roof systems.

COMPOSITION & MATERIALS

Ecoasis™ Premium is manufactured on a woven fiberglass mat and impregnated on both sides with Flexor™ SBS polymer modified asphalt that is compounded with a fire-retardant mineral stabilizer. Ecoasis™ Premium is surfaced with embedded, Scotchgard™ algae resistant granules.

APPLICATION

Shingles should be applied over a Malarkey underlayment or an approved, code-compliant substitute. Installation instructions are available on the shingle wrapper, at WWW.MALARKEYROOFING.COM, or by contacting your local Malarkey representative. Industry standards are found in NRCA manuals. Shingles should be attached to decking with approved fasteners, and Malarkey recommends the use of corrosion-resistant nails for this purpose. Staples are not allowed.

PRECAUTION

For best results, Malarkey recommends Ecoasis™ Premium be protected from the weather and stored in a cool, dry, well-ventilated area until applied. Do not double-stack pallets. Do not use on roofs where the slope is less than 2:12 (2" [51 mm] per 12" [305 mm]). For slopes 2:12 up to 4:12 (4" [102 mm] per 12" [305 mm]), additional deck protection is required. Ecoasis™ Premium has a factory-applied self-sealing strip that activates in warm weather. When applied in cold weather or windy locations, hand-sealing is recommended but not required if sealant activates. In high wind areas and on slopes greater than 12" (305 mm) per 12" (305 mm), hand-sealing underneath and six nails are required. Contact Malarkey for further conditions and instructions.

WARRANTY

Malarkey Roofing Products® offers various warranties to meet specific requirements. The warranty packages available for Ecoasis™ Premium include a Limited Lifetime Warranty, a 110 mph (177 kph) Limited Wind Warranty, and can be combined with other Malarkey products for a 130 mph (209 kph) Enhanced Wind Warranty. Ecoasis™ Premium also carries a 20-year Scotchgard™ warranty against algae growth. Contact your roofer, local distribution center, or Malarkey for full details. See below for TECHNICAL ASSISTANCE contact information.

Ecoasis™ Premium and other Malarkey products are available throughout North America and Pacific Rim countries.

Visit WWW.MALARKEYROOFING.COM for additional product information and availability.

Note: Malarkey Roofing Products® (Malarkey) Inventory SKU number for this product: 283 Ecoasis™ Premium featuring the Scotchgard™ Algae Resistant Shingle Protector from 3M

TECHNICAL ASSISTANCE:

Malarkey has technical services assistance available.
Contact Malarkey for details:
Call weekdays 7:00 am to 5:00 pm PST,
at 800.545.1191 or 503.283.1191.
technicalinquiries@malarkeyroofing.com

CORPORATE OFFICE:

3131 N. Columbia Blvd. Telephone: 503.283.1191
Portland, OR 97217-7472 or 800.545.1191
P.O. Box 17217 Fax: 503.289.7644
Portland, OR 97217-0217

Effective 5/15

Supersedes all previously published data

Check for most current version on our website.

**FLEXOR™ SBS POLYMER MODIFIED
SOLAR REFLECTIVE SHINGLES**



SOLAR REFLECTANCE TECHNICAL DATA

Ecoasis™ Premium is listed with the Cool Roof Rating Council. Ecoasis™ Premium has tested to these radiative property values:



Cool Roof Rating Council ratings are determined for a fixed set of conditions, and may not be appropriate for determining seasonal energy performance. The actual effect of solar reflectance and thermal emittance on building performance may vary.

Manufacturer of product stipulates that these ratings were determined in accordance with the applicable Cool Roof Rating Council procedures.

	ECOASIS™ PREMIUM (AGAVE)		ECOASIS™ PREMIUM (MESQUITE)		ECOASIS™ PREMIUM (TUMBLEWEED)	
	INITIAL	WEATHERED	INITIAL	WEATHERED	INITIAL	WEATHERED
SOLAR REFLECTANCE	0.27	0.25	0.28	0.26	0.26	0.26
THERMAL EMITTANCE	0.92	0.96	0.93	0.97	0.93	0.94
SOLAR REFLECTIVE INDEX (SRI)	29	28	31	30	28	28
Related Product ID Licensed Manufacturer ID: 0850 Classification: Production Line	0850-0020		0850-0018		0850-0019	



Energy Star is only recognized in the U.S., not in Canada.

Effective 5/15
Supersedes all previously published data
Check for most current version on our website.

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SOLAR REFLECTIVE

Introducing Malarkey's family of cool roof colors.

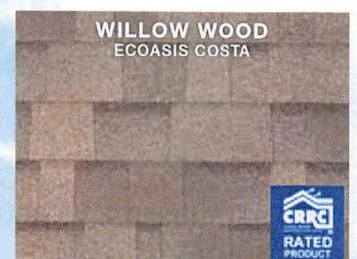
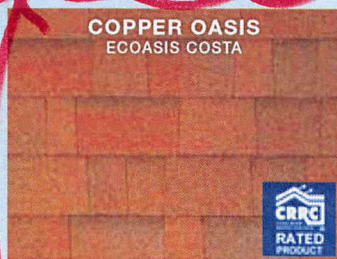
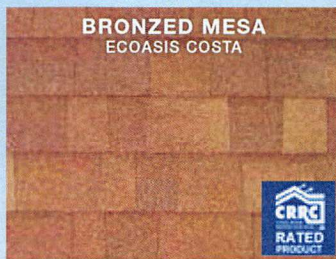
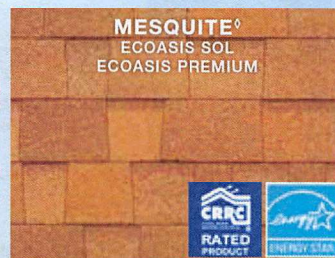
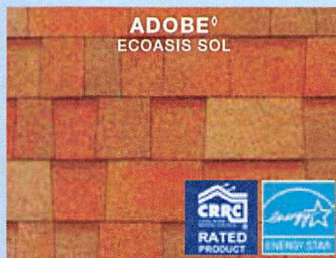


ECOASIS™

COOL ROOFING GRANULES FROM 3M

SOLAR REFLECTIVE LAMINATE SHINGLE LINE

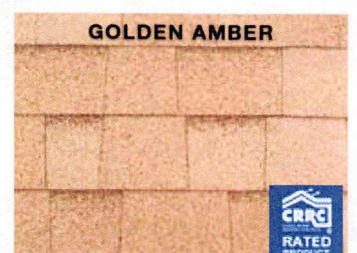
The Ecoasis™ line of shingles feature Cool Roofing Granules from 3M that reflect solar rays, which may reduce the amount of heat entering your home and can result in lower attic temperatures compared to standard shingle colors. These shingles meet required solar reflectance to be designated with industry leading energy conservation standards: Ecoasis™ Premium and Ecoasis™ Sol are listed with the Cool Roof Rating Council, are California Energy Code, Title 24, Part 6 compliant, and meet ENERGY STAR certification standards. Ecoasis™ Costa is listed with the Cool Roof Rating Council and is California Energy Code, Title 24, Part 6 compliant. Colors with an SRI at 29 or above also meet LEED requirements. To augment the Ecoasis™ shingle line, Malarkey makes solar reflective 8" EZ-Ridge™, 10" EZ-Ridge™ XT, and 10" RidgeFlex™ hip and ridge shingles in matching colors.



DURA-SEAL™

SOLAR REFLECTIVE 3-T

Dove White and Golden Amber shingles reflect solar rays, which may reduce the amount of heat entering your home and can result in lower attic temperatures compared to standard shingle colors. These shingles meet required solar reflectance to be designated with industry leading energy conservation standards: Highlander™ Dove White and Dura-Seal™ Dove White are listed with the Cool Roof Rating Council, are California Energy Code, Title 24, Part 6 compliant, and meet ENERGY STAR certification standards. Highlander™ Golden Amber is listed with the Cool Roof Rating Council.



SOLAR REFLECTIVE

Introducing Malarkey's family of cool roof colors.

ECOASIS™ Premium



ECOASIS™ SOL

ECOASIS™ Costa

HIGHLANDER® DURA-SEAL™



SOLAR REFLECTANCE TECHNICAL DATA

Ecoasis™ Premium, Ecoasis™ Sol, Highlander™ Dove White, and Dura-Seal® Dove White are listed with the Cool Roof Rating Council (CRRC) and are ENERGY STAR certified. Ecoasis™ Costa and Highlander™ Golden Amber are only CRRC listed. All shingles have tested to these radiative property values:

			SOLAR REFLECTANCE		THERMAL EMITTANCE		SOLAR REFLECTIVE INDEX (SRI)		RELATED PRODUCT ID
			INITIAL	WEATHERED	INITIAL	WEATHERED	INITIAL	WEATHERED	
◇ ✓	AGAVE	ECOASIS™ PREMIUM	0.27	0.25	0.92	0.96	29	28	0850-0020
◇ ✓	MESQUITE	ECOASIS™ PREMIUM	0.28	0.26	0.93	0.97	31	30	0850-0018
◇ ✓	TUMBLEWEED	ECOASIS™ PREMIUM	0.26	0.26	0.93	0.94	28	28	0850-0019
✓ ✓	ADUBE	ECOASIS™ SOL	0.28	0.26	0.91	0.96	30	29	0850-0012
◇ ✓	AGAVE	ECOASIS™ SOL	0.25	0.25	0.92	0.96	26	28	0850-0015
◇ ✓	MESQUITE	ECOASIS™ SOL	0.28	0.26	0.89	0.96	29	29	0850-0010
◇ ✓	TUMBLEWEED	ECOASIS™ SOL	0.26	0.25	0.91	0.97	27	28	0850-0017
✓	BRONZED MESA	ECOASIS™ COSTA	0.21	Pending	0.92	Pending	21	Pending	0850-0025
✓	COPPER OASIS	ECOASIS™ COSTA	0.20	Pending	0.92	Pending	20	Pending	0850-0027
✓	FROSTED GRANITE	ECOASIS™ COSTA	0.22	Pending	0.92	Pending	22	Pending	0850-0026
✓	WILLOW WOOD	ECOASIS™ COSTA	0.20	Pending	0.92	Pending	20	Pending	0850-0028
◇ ✓	DOVE WHITE	HIGHLANDER®	0.27	0.27	0.90	0.96	28	31	0850-0014
✓	GOLDEN AMBER	HIGHLANDER®	0.21	Pending	0.94	Pending	22	Pending	0850-0024
◇ ✓	DOVE WHITE	DURA-SEAL™	0.26	0.28	0.91	0.98	27	33	0850-0013

Cool Roof Rating Council ratings are determined for a fixed set of conditions, and may not be appropriate for determining seasonal energy performance. The actual effect of solar reflectance and thermal emittance on building performance may vary.

Manufacturer of product stipulates that these ratings were determined in accordance with the applicable Cool Roof Rating Council procedures.

Licensed Manufacturer ID: 0850 Classification: Production Line ◇ ENERGY STAR certified ✓ CRRC listed

DISCLAIMER: Sample pieces or photographs of shingles may not accurately represent the true color or variations of color blends that will appear on the roof. Before installation, five or six shingles should be laid out and reviewed for conformity to desired color level. If color levels are unsatisfactory, advise your dealer before proceeding with installation. Colors and specifications subject to change without notice. Shingle colors not available in all regions. Limited warranties carry terms and conditions. Please contact your local Malarkey representative for color availability and further information. See Malarkey's Shingle and Accessory Warranty for details.

* For complete Limited Lifetime Warranty details, reference Malarkey's Shingle and Accessory Warranty.

* Malarkey shingles featuring Scotchgard™ Protector must be installed with EZ-Ridge™ XT (10") or RidgeFlex™ (10") hip and ridge products, which feature Scotchgard™ Protector, to receive Malarkey's full 20-year Algae Resistant Shingle warranty. Scotchgard and the Scotchgard logo, including the plaid design and 3M logo, are all trademarks of 3M.

◇ ENERGY STAR only applies to Ecoasis™ Premium and Ecoasis™ Sol shingles, and to Highlander® and Dura-Seal™ shingles in Dove White. ENERGY STAR is only recognized in the United States, not in Canada.

‡ Reflectance rates calculated using 3M reflectivity test methods. Actual reflective results for asphalt shingles made with 3M Cool Roofing Granules will vary by application.

This version supersedes all previous versions. Rev. 4/16

Malarkey
Roofing Products®
Defining Excellence.™



P.O. BOX 17217, Portland, OR 97217
503.283.1191 | 800.545.1191 | Fax: 503.289.7644
WWW.MALARKEYROOFING.COM

TECHNICAL DETAILS

WIDTH ± 1/8" 8" 203 mm	LENGTH ± 1/8" 11 1/2" 292 mm
EXPOSURE 8 1/4" 210 mm	GRANULE ADHESION 0.35 g Typical Results
SHINGLES/BOX 30	BOXES/PALLET 42
LINEAR COVERAGE 20' 6.1 m	

TEST COMPLIANCE

ASTM D3161 Class F	ASTM E108 Class A Fire Rating
FBC APPROVAL #14809	ICC APPROVAL ESR-3150
UL RATING 2218 Class 4	
	

FEATURES & BENEFITS

- Distinctive design with elevated profile
- Colors blended to match shingles
- Sustainable NEX® asphalt technology
- Exceptional all-weather performance
- UL 2218 Class 4 impact resistance
- 3M™ Smog-Reducing Granules
- 3M™ Scotchgard™ algae protection

**NEX® POLYMER MODIFIED
8" WIDE, HIGH-PROFILE
HIP AND RIDGE SHINGLES**



PRODUCT USE

222 EZ-Ridge™ Hip and Ridge Shingles (EZ-Ridge™) are 8" wide, fortified with sustainable NEX® polymer modified asphalt technology, and designed to complement a number of asphalt shingle roofing systems. EZ-Ridge™ is an easy-to-install, high-profile roofing accessory providing resilient protection to hips and ridges, strong defense for ridge vents from weathering, and long-lasting appeal. EZ-Ridge™ features Scotchgard™ Protector from 3M to resist shingle discoloration due to algae growth. Malarkey roofing systems with algae resistant warranties *require* algae resistant hip and ridge shingles.

COMPOSITION & MATERIALS

EZ-Ridge™ Hip and Ridge Shingles are manufactured on a non-woven fiberglass mat and coated with Malarkey's unique NEX® polymer modified bitumen (asphalt). Its surface incorporates an innovative combination of ceramic granules that provide varied color, weatherability, algae protection, and now, smog reduction. EZ-Ridge™ Hip and Ridge Shingles are blended to match Malarkey field shingles.

APPLICATION

Installation instructions are available on the shingle box, at WWW.MALARKEYROOFING.COM, or by contacting your local Malarkey representative. EZ-Ridge™ should be attached to the roof shingles with approved fasteners, and Malarkey recommends the use of corrosion-resistant nails long enough to penetrate all layers of shingles and completely through the roof deck or into the deck a minimum of 3/4" (19 mm). Staples are not allowed. Industry standards can be found in NRCA manuals. Contact Malarkey's Technical Services Department when installing this product over ridge venting products.

PRECAUTION

For best results, Malarkey recommends EZ-Ridge™ be protected from the weather and stored on pallets in a cool, dry, well-ventilated area until applied. EZ-Ridge™ Hip and Ridge Shingles have a factory-applied, seal-down/adhesive strip that activates in warm weather. When applied in cold weather or windy locations, hand-sealing is recommended but not required if sealant activates. Should hand-sealing be necessary, apply shingle tab adhesive under each lower corner first and then fasten. Contact Malarkey for further conditions and instructions.

WARRANTY

EZ-Ridge™ Hip and Ridge Shingles are eligible for expanded warranty coverages relative to its use as a single roofing accessory or in combination with others in a complete Malarkey roofing system. When installed with algae resistant shingles, EZ-Ridge™ is covered by Malarkey's Limited Lifetime Scotchgard™ Protector Warranty. Installed separately, it carries a 10-year product warranty against manufacturing defects. Contact your roofing contractor, local distribution center, or Malarkey for full details. See below for TECHNICAL ASSISTANCE contact information.

EZ-Ridge™ and other Malarkey products are available throughout North America and Pacific Rim countries. Visit WWW.MALARKEYROOFING.COM for additional product information and availability.

Note: Malarkey Roofing Products® inventory SKU number for this product: 222 8" EZ-Ridge™ Hip and Ridge Shingles featuring Scotchgard™ Protector from 3M

TECHNICAL ASSISTANCE:

Malarkey has technical services assistance available.
Contact Malarkey for details:
Call weekdays 7:00 am to 5:00 pm Pacific Time
at 800.545.1191 or 503.283.1191.
technicalinquiries@malarkeyroofing.com

CORPORATE OFFICE:

3131 N. Columbia Blvd. Telephone: 503.283.1191
Portland, OR 97217-7472 or 800.545.1191
P.O. Box 17217 Fax: 503.289.7644
Portland, OR 97217-0217

Effective 9/20

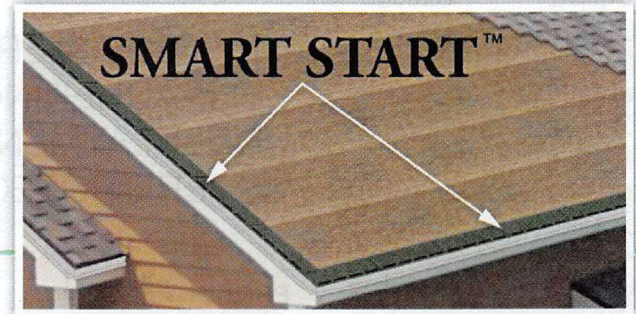
Supersedes all previously published data

Check for most current version on our website.

TECHNICAL DETAILS

FULL-SIZE SHINGLE 16 ³ / ₈ " x 38 ¹ / ₄ " 416 mm x 972 mm	PIECE SIZE 8 ³ / ₁₆ " x 38 ¹ / ₄ " 208 mm x 972 mm
LINEAR FT./BUNDLE 114' 9" 35 m	GRANULE ADHESION 0.3 g Typical Results
SHINGLES/BUNDLE 18 full-size 36 pieces	BUNDLES/PALLET 21 from OR/CA/OK

NEX® POLYMER MODIFIED SMART START™ STARTER SHINGLES



TEST COMPLIANCE

ASTM
D3462

FEATURES & BENEFITS

- Full-size starter shingle
- Sustainable NEX® asphalt technology
- Separates at perforation to provide two code-compliant starter shingles
- Seal-down strip holds first course shingles fast to the eave
- Protects against moisture intrusion and blow-off

PRODUCT USE

The 210 Smart Start™ shingle is perforated to be separated into two full-size, code-compliant starter shingles for up to 6³/₁₆" exposure (see drawing below). The perforation saves time and is safer than hand-cutting shingles. Smart Start™ is required under Malarkey shingles at the eave to provide a secure seal between the starter and first course shingles, helping prevent blow-offs and moisture intrusion on steep slope roofing. It is also *recommended* for the rakes to provide a clean edge and increase wind resistance.

COMPOSITION & MATERIALS

Smart Start™ is manufactured on a non-woven fiberglass mat, coated on both sides with NEX® polymer modified bitumen (asphalt) compounded with a fire-retardant mineral stabilizer, and mineral surfaced.

APPLICATION

Smart Start™ shingles should be applied over a Malarkey underlayment (or an approved, code-compliant substitute) and under the first course of shingles. Windsor® *designer* shingle installations require Smart Start™ under Windsor® Starter shingles. Complete installation instructions are available on the shingle wrapper by scanning the corresponding Quick Response (QR) code, on our website at WWW.MALARKEYROOFING.COM, or by contacting your local Malarkey representative. Industry standards are found in NRCA manuals. Shingles should be attached to decking with approved fasteners, and Malarkey recommends the use of corrosion-resistant nails for this purpose. Staples are not allowed.

PRECAUTION

For best results, Malarkey recommends Smart Start™ be protected from the weather and stored in a cool, dry, well-ventilated area until applied. Do not double-stack pallets. Do not use on roofs where the slope is less than 2:12 (2" [51 mm] per 12" [305 mm]). In high wind areas and on slopes greater than 21" (533 mm) per 12" (305 mm), fastening with six nails is required. Contact Malarkey for further conditions and instructions.

WARRANTY

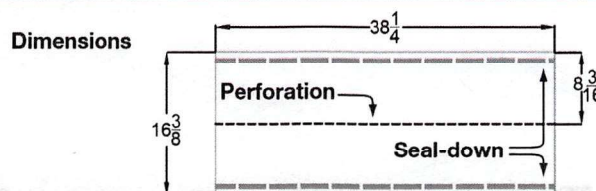
Smart Start™ is eligible for *Limited Lifetime Warranty* coverage when used in conjunction with Malarkey shingles and one other Malarkey accessory. See Malarkey's *Shingle & Accessory Warranty* for complete details on all warranty coverages available. Contact your roofing contractor, local distribution center, or Malarkey for full details. See below for TECHNICAL ASSISTANCE contact information.

Smart Start™ and other Malarkey products are available throughout North America and Pacific Rim countries.

Visit WWW.MALARKEYROOFING.COM for additional product information and availability.

Note: Malarkey Roofing Products® inventory SKU number for this product: 210 Smart Start™

ILLUSTRATION



TECHNICAL ASSISTANCE:

Malarkey has technical services assistance available. Contact Malarkey for details: Call weekdays 7:00 am to 5:00 pm PST, at 800.545.1191 or 503.283.1191. technicalinquiries@malarkeyroofing.com

CORPORATE OFFICE:

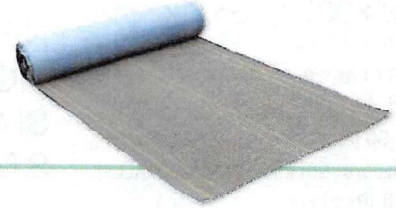
3131 N. Columbia Blvd. Telephone: 503.283.1191
Portland, OR 97217-7472 or 800.545.1191
P.O. Box 17217 Fax: 503.289.7644
Portland, OR 97217-0217

Effective 10/19
Supersedes all previously published data
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TECHNICAL DETAILS

WEIGHT/ROLL 60 lbs. 27.2 kg	ROLL SIZE 2 square roll
WIDTH 36" 0.91 m	LENGTH 65' 19.8 m
THICKNESS 55 mils nominal	TOTAL AREA PER ROLL 195 ft ² 18.1 m ²
ROLLS/PALLET 25 from OR/CA	ROLLS/PALLET 28 from OK
PERM RATING ≤ 0.1 U.S. perms	LAY LINES 2", 4", 17" 51 mm, 102 mm, 432 mm

NEX® POLYMER MODIFIED
SELF-ADHERING
UNDERLAYMENT FOR ICE AND
WATER PROTECTION



PRODUCT USE

401 Arctic Seal® is a specially designed and manufactured, self-adhering, NEX® SBS polymer modified asphalt underlayment for use on steep slopes to prevent moisture intrusion from ice dams and wind-driven rain, as required by many building codes. Arctic Seal® serves a dual role as a flashing membrane, helping protect areas susceptible to leaks such as valleys, roof-to-wall transitions, and around vents and skylights. Arctic Seal® is approved for use under fire-rated, code-compliant roof coverings and as a vapor retarder in various FM Approved roofing assemblies. Consult Malarkey's Technical Services Department for approval of roof systems.

COMPOSITION & MATERIALS

Arctic Seal® is manufactured on a non-woven fiberglass mat with a NEX® SBS polymer modified bitumen (asphalt) top coating and surfaced with a sand release agent. The underside has an aggressive asphalt-based adhesive, protected with a factory-applied, split-release film that is removed prior to installation.

APPLICATION/INSTALLATION

Arctic Seal® shall be applied as specified. Roof decks should be sound, smooth, dry, meet necessary local requirements, and provide positive drainage. Minimum approved slope for *steep slope* applications is 2" (51 mm) per 12" (305 mm). When using Arctic Seal® for full deck protection, make sure adequate ventilation and moisture control issues are addressed. Do not use Arctic Seal® as an underlayment under metal roofs, but it is recommended under and around sheet metal flashing details on shingle roofs, including valley metal. It is not intended as a permanently-exposed roofing surface but can be left uncovered for up to 60 days if necessary before the primary roof covering is installed. Arctic Seal® has passed ASTM D5147 *compound stability* testing up to 225°F (107°C) without failure. Installation instructions can be found at WWW.MALARKEYROOFING.COM or by contacting our Technical Services Department.

STORAGE & HANDLING

For best results, Malarkey recommends Arctic Seal® be protected from the weather and stored on end in a cool, dry, well-ventilated area until applied.

WARRANTY

Arctic Seal® is eligible for expanded warranty coverages relative to its use as a single roofing *accessory* or in combination with others in a complete Malarkey roofing system. Installed separately, it carries a 10-year product warranty against manufacturing defects. Contact your roofing contractor, local distribution center, or Malarkey for full details. See below for TECHNICAL ASSISTANCE contact information.

Arctic Seal® and other Malarkey products are available throughout North America and Pacific Rim countries. Visit WWW.MALARKEYROOFING.COM for additional product information and availability.

Note: Malarkey Roofing Products® inventory SKU number for this product: 401 Arctic Seal®

TEST COMPLIANCE

ASTM
D1970



FEATURES & BENEFITS

- Sustainable NEX® asphalt technology
- Self-adhering; waterproof
- Seals around nails
- Protects against leaks from ice dams and wind-driven rain
- Equally effective flashing membrane

TECHNICAL ASSISTANCE:

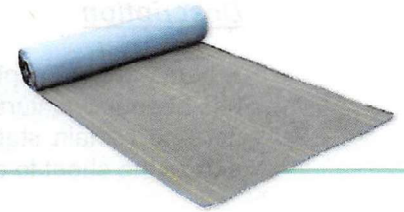
Malarkey has technical services assistance available.
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at 800.545.1191 or 503.283.1191.
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Effective 7/20
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**NEX® POLYMER MODIFIED
SELF-ADHERING
UNDERLAYMENT FOR ICE AND
WATER PROTECTION**



PHYSICAL PROPERTIES	ASTM SPECIFICATION D1970	TYPICAL RESULTS
Maximum load MD/CD, min	25 lbf/in. (4.4 kN/m)	Pass
Elongation @ break, min of modified bitumen portion	10%	Pass
Adhesion to plywood, min at 40°F (4.4°C)	2.0 lbf/ft width (0.92 kgf/30.5 cm)	Pass
Adhesion to plywood, min at 75°F (24°C)	12.0 lbf/ft width (5.44 kgf/30.5 cm)	Pass
Thermal stability, max	0.1 in. (3 mm)	No flow
Flexibility temperature	-20°F (-29°C)	Pass
Tear resistance MD/CD, min	20 lbf (89 N)	Pass
Moisture vapor permeance, max	0.1 U.S. perms (5.7 ng/Pa.S.M. ²)	0.03 U.S. perms (1.71 ng/Pa.S.M. ²)
Sealability around nail	No leaks	Pass
Waterproof integrity after low temperature flexibility	No leaks	Pass
Waterproof integrity of lap seam	No leaks	Pass

As manufactured, Arctic Seal® meets the requirements of ASTM D1970 TABLE 1, Physical Requirements of Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection.

Effective 7/20
Supersedes all previously published data
Check for most current version on our website.
WWW.MALARKEYROOFING.COM

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Page 2 of 2

NO. 30 FELT PLAIN 2 SQ. ASTM D226

Description

A heavy-weight asphalt roofing felt made of a specially formulated organic sheet which has been fully saturated with waterproofing asphalt. This sheet is pre-conditioned to lay flat and remain stable during and after installation. Guidelines are provided every 2" across the sheet to aid the roofer in keeping asphalt shingles aligned.

Uses

May be used as an eave protector on sloped roofing or as a complete high performance underlayment beneath heavy roofing such as tile or metal.

Physical Specifications

Conforms to:	ASTM D226
Average Breaking Strength:	
Along fibre grain:	Exceeds 7 kN/m (40 lb/in) of width
Across fibre grain:	3.5 kN/m (20 lb/in) of width
Average roll weight, lbs/roll:	57 (approx.)

Packaging

Roll width:	36" (0.09 m.) also available in 44"
Roll Contents:	216 sq.ft. (20 sq.m.)
Rolls per pallet:	25
Pallets size:	40" x 48"

Installation

- 1) **DECK PREPARATION:** Proper deck preparation is an essential step to ensure that the roofing remains problem free.

When preparing roof deck:

- Follow all instructions supplied by the manufacturer of the shingles or other roofing.
- Remove and replace any broken or decaying lumber.
- Remove loose nails and ensure that all decking is securely fastened to sound framing members with proper fasteners.
- If installing new O.S.B. sheathing, allow a 3/16" gap at end joints and 1/8" gap at side joints.

Continued on next page



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Telephone: (604) 888-0777
Toll Free: 1-800-663-0076
Fax: (604) 888-1656

NO. 30 FELT PLAIN 2 SQ. ASTM D226 Cont'd

- 2) **ATTIC HUMIDITY:** Check for adequate ventilation under the roof deck. High humidity due to improper attic venting can cause wrinkles or ridging to occur in some roofing materials. It can also cause new plywood or O.S.B. to expand excessively which may also cause ridging in the roofing materials. Problems caused by high humidity are usually of an aesthetic nature and may not be protected by roofing material warranties.

- 3) **UNDERLAYMENT INSTALLATION:** No. 30 Felt Plain 2 SQ ASTM D226 asphalt felt is a heavy sheet which suits a heavier style of finished roofing. When used under lightweight roofing, such as asphalt shingles, No. 30 Felt Plain 2 SQ ASTM D226 asphalt felt may telegraph expansion ripples to the shingles when deck humidity is excessive.

To help avoid this problem:

- Roll the felt out and allow it to warm up before fastening down.
- Cut the felt into shorter segments (approx. 15 ft.) to reduce expansion potential.
- Install extra nails in the felt at the time the shingles are placed.
- Eliminate humidity problems by improving attic ventilation.

Caution

Great care must be exercised in all phases of steep slope roof application. Follow the safety guidelines of the safety authority having jurisdiction in your area.

The information provided herein, while not guaranteed, is to the best of our knowledge true and accurate. Except when agreed to in writing for specific conditions of use, no warranty or guarantee expressed or implied is made regarding the performance of any products, since the manner of use and handling are beyond our control. The user of such information assumes all risk connected with the use thereof. Nothing contained herein is to be construed as permission or as a recommendation to infringe any patent.

Revised: Apr 30, 2015

FE1400



Laminate Shingle Installation Instructions

Includes the following shingles:

Highlander[®] NEX[®]

Highlander[®] NEX[®] AR

Vista[®]

Vista[®] AR

Ecoasis[™] NEX[®]

Legacy[®]

Legacy[®] Scotchgard[™]

Featuring:

The Zone[®]

Directions for Applying Malarkey Laminate Shingles

GENERAL INSTRUCTIONS

Install Malarkey laminate shingles according to adopted building code and local amendments. To qualify for warranty protection and obtain stated coverage, the installation instructions detailed here must be followed. Contact Malarkey Technical Services or check our website at WWW.MALARKEYROOFING.COM for the most current version.

We assume no responsibility when there has been improper application, failure to properly prepare the surface or provide proper ventilation according to FHA or HUD minimum property standard requirements and adopted building code.

For current warranty information, visit WWW.MALARKEYROOFING.COM/warranty-center.

Standard exposure is 5 $\frac{5}{8}$ " (143 mm) to the weather. Offset between courses is 8" (203 mm). Minimum offset for shingle installation is 4" (102 mm).

These step-by-step application instructions apply to standard slopes/inclines of not less than 4" (102 mm) per 12" (305 mm) or more than 21" (533 mm) per 12" (305 mm). For lower slopes [2" (51 mm) to less than 4" (102 mm) per 12" (305 mm)] and steep slopes [more than 21" (533 mm) per 12" (305 mm)], modify the installation as described below. Do not apply shingles on roofs having a slope less than 2" (51 mm) per 12" (305 mm).

Note: The film strips on each shingle, front and back, prevent shingles from sticking together while in the bundle and are not designed to be removed.

IMPORTANT

- ALWAYS wear fall protection when working on a roof.
- Underlayments can be slippery, particularly when wet or covered with frost. Be careful when walking on them.

Ventilation: To prevent harmful condensation or heat buildup, air must circulate freely under the roof deck. Install roof vents at ridges and eaves. Ventilation provisions must meet or exceed current FHA or HUD requirements and adopted building codes.

Roof Deck: The surface to receive the new roofing should be in good shape and solidly sheathed, constructed of a minimum $\frac{3}{8}$ " (10 mm) thick, exterior-grade plywood, $\frac{7}{16}$ " (11 mm) thick oriented strand board (OSB), or seasoned lumber, nominally 1" (25 mm) thick. Boards should be positioned tight to each other and securely nailed to framing members. Deteriorated or rotted boards should be replaced. For excessively resinous areas and loose knots, cover with sheet metal patches.

Malarkey strongly recommends installing sheathing when wood board decking is the existing substrate. Problems with the performance of your roofing system, such as leaks and buckling, increase if installed directly over wood board decks. Failure to use properly conditioned deck materials can result in deck movement which can damage the roof covering and may void your warranty.

Drip Edge Flashing: In accordance with 2018 International Building Code, Section 1507.2.8.3, and 2018 International

Residential (Building) Code, Section R905.2.8.5, *drip edge flashing* (drip edge, eave or rake metal) is required along the eave and rake edges of shingle roofs.

Install drip edge first along the eaves, and later on the rakes once the field underlayment has been applied.

UNDERLAYMENT

Malarkey makes two types of underlayment, the first being water-resistant, *mechanically-attached* field underlayments Right Start™ UDL and our Secure Start® line of synthetic underlayments.

The second type are waterproof, *self-adhering* underlayments, Arctic Seal® and Secure Start® HT products which are intended for use in cold weather climates that produce ice dams.

Self-adhering underlayment can also be installed as a flashing membrane in areas susceptible to leaks such as roof valleys, roof-to-vertical transitions, and around vents, curbs, skylights and other roof penetrations.

Underlayment is required on roof decks prior to the installation of Malarkey shingles. Your geographical location, weather, degree of roof slope, and type of roof covering will help determine which Malarkey underlayment is right for your situation. Consult local building code for additional guidance.

Complete installation instructions are available on our website at WWW.MALARKEYROOFING.COM.

Other Instructions Common to the Installations that Follow:

- Underlayment is installed parallel to the eaves.
- End laps in the same course should be 6" (152 mm), and staggered 6' (1.8 m) apart in subsequent courses.
- Extend field underlayments 6" (152 mm) over hips, ridges and valleys. Where the roof meets a vertical surface, run the underlayment a minimum of 3" (76 mm) up the wall and secure.
- Once an expanse of roof is covered by underlayment up to the ridge, apply drip edge flashing to the rakes, over the ends of underlayment.

INSTALLATION IN NON-ICE DAM REGIONS

Roof Slopes 4:12 and Greater

Roof slopes 4:12 (4" [102 mm] per 12" [305 mm]) and greater require the installation of a single (1) layer of Malarkey's field underlayment (or code-compliant equivalent) over the entire roof deck.

Install the initial course flush to the eave and trim at the rake. Fasten sufficiently to hold the underlayment in place and work safely until shingles are applied or according to adopted building code. Secure Start® underlayments have bullseye imprints on the material to act as guides for fastening.

Continue working up the roof, subsequent courses overlapping the preceding by 2"-4" (51-102 mm), depending on the type of underlayment being applied. (See **Figure 1**)

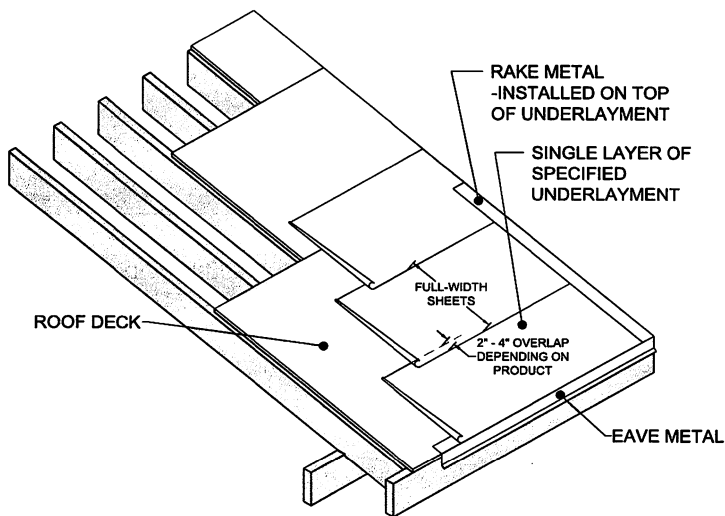


Figure 1 - Application of Field Underlayment on Roof Slopes 4:12 and Greater (Non-Ice Dam Regions)

Roof Slopes 2:12 Up to 4:12

Lower slopes require a *double layer* of underlayment.

Start at a lower corner of roof and begin by applying a half-width *starter strip* of field underlayment (or code-compliant equivalent) along the eaves.

Succeeding courses are all full-width, the first course completely overlapping the starter, and followed by courses half-lapped over preceding courses, on up the roof.

Fasten sufficiently to hold in place and work safely until shingles are applied or according to adopted building code. (See **Figure 2**)

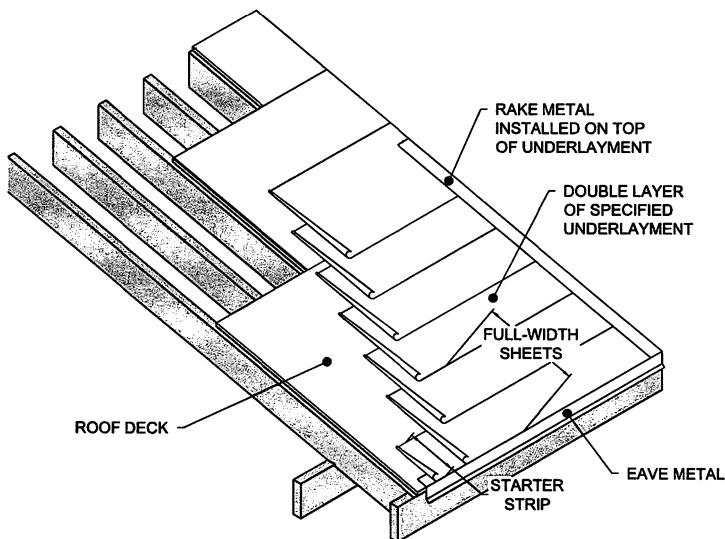


Figure 2 - Application of Field Underlayment on Roof Slopes 2:12 Up to 4:12 (Non-Ice Dam Regions)

Optional installation for low slope roofs: For superior protection in coastal regions, areas of wind-driven rain, or homes with double-slope construction, the roof deck can be covered with a double layer of Arctic Seal® self-adhering underlayment or equivalent conforming to ASTM D1970.

When choosing this option, make sure proper ventilation and moisture control issues are addressed.

INSTALLATION IN ICE DAM REGIONS

Roof Slopes 4:12 and Greater

In geographic regions that experience the possibility of ice dams along the eaves (or if required by building code), install a full-width sheet of *self-adhering* underlayment (or equivalent underlayment conforming to ASTM D1970) along the eaves.

Continue installing self-adhering underlayment up and out onto the roof no less than 24" (610 mm) past the inside, warm interior wall of the house or above the expected level of ice dams or according to building code requirements.

If additional courses of self-adhering underlayment are necessary to reach that point, *course lap guide lines* (lay lines) on the sheets show how far to lap the material. Firmly hand-roll these overlaps to ensure a complete, watertight bond.

Once past 24" (610 mm), follow with full-width courses of your specified field underlayment, the first course lapped 6" (152 mm) over the termination of self-adhering underlayment and the rest with 2"-4" (51-102 mm) side laps, depending on the type of underlayment being applied. Lay lines show how far to lap the material.

Fasten as described above.

For extra protection at the eaves and prior to the installation of drip edge, install a 6"-wide (152 mm) stripping ply of Arctic Seal®, and ensure it covers the junction of roof and fascia. (See **Figure 3**)

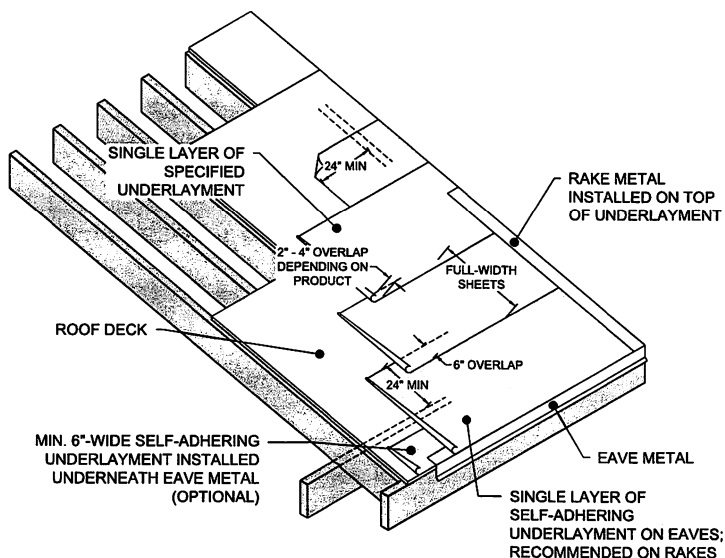


Figure 3 - Application of Self-Adhering and Field Underlayments on Roof Slopes 4:12 and Greater (Ice Dam Regions)

Roof Slopes 2:12 Up to 4:12

Like 4:12 and greater slopes, begin with a full-width sheet of self-adhering underlayment (or equivalent compliant with ASTM D1970) along the eaves.

Continue application up and out onto the roof as necessary to a point not less than 24" (610 mm) past the inside, warm interior wall of the house or above the expected level of ice dams or according to building code requirements.

Once that point is reached, switch to *double layers* of your specified field underlayment, the first course a half-width *starter strip* lapped 6" (152 mm) over the termination of self-adhering underlayment.

Succeeding courses are full-width, the first course completely overlapping the starter, and followed by courses half-lapped over preceding courses, on up the roof.

Fasten as described above. (See Figure 4)

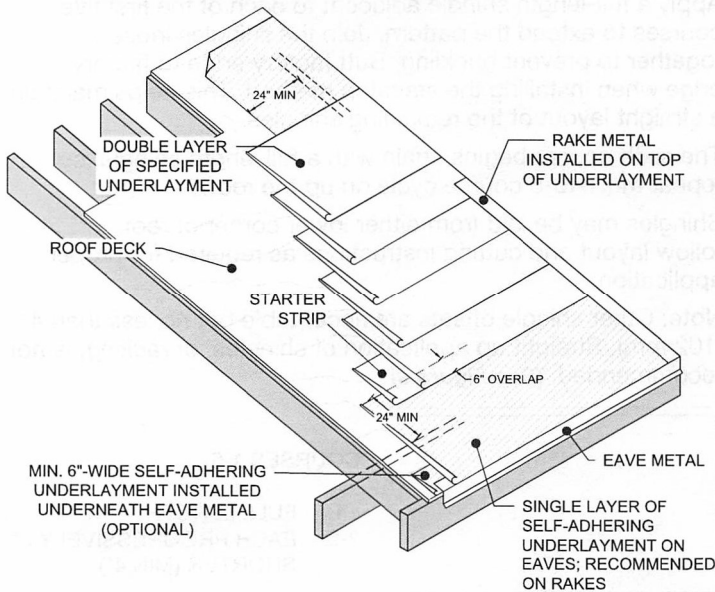


Figure 4 - Application of Self-Adhering and Field Underlayments on Roof Slopes 2:12 Up to 4:12 (Ice Dam Regions)

SHINGLE FASTENING

Type of Fasteners: Fasteners must be minimum 12-gauge (0.105 inch [3 mm]) shank, galvanized steel, stainless steel, aluminum or copper roofing nails, with a $\frac{3}{8}$ " (10 mm) head, compliant with ASTM F1667, and long enough to penetrate through all layers of roofing materials and at least $\frac{3}{4}$ " (19 mm) into the roof sheathing. Where the roof sheathing is less than $\frac{3}{4}$ " (19 mm) thick, the fasteners shall penetrate through the sheathing.

Malarkey approves the use of hand-nailing and/or pneumatic nailers for applying fasteners, but nails must be driven flush to the shingle surface and not overdriven, underdriven or driven at an angle, especially on low slope installations where water runs off less freely and leaks could result. When fastening adjacent shingles, butt them loosely together to prevent buckling.

The use of staples is not an approved fastening method. (See Figure 5)

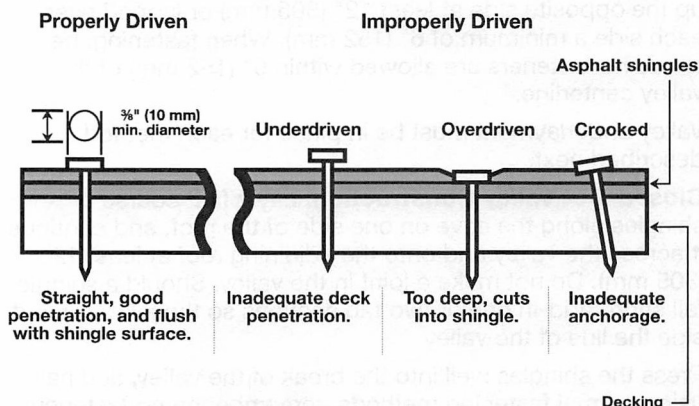


Figure 5 - Nailing Instructions

Nailing Pattern: Under normal conditions, use four (4) fasteners for each full shingle.

Fasteners must be placed in the nailing area approximately 1" (25 mm) in from each edge and the remaining fasteners evenly spaced between. Malarkey laminate shingles feature The Zone®, an enlarged, $1\frac{5}{16}$ " (33 mm) wide nailing area that helps ensure correct fastener placement. (See Figure 6)

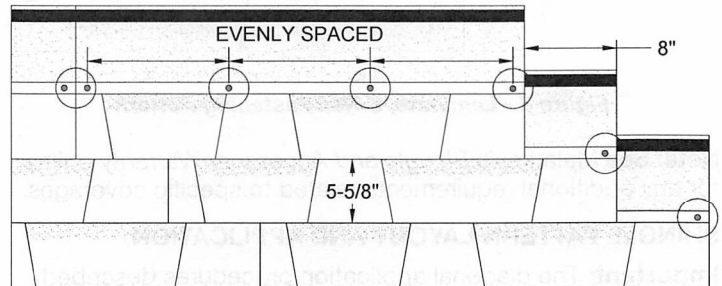


Figure 6 - Laminate, 4-Nail Fastening Pattern

Wind Resistance and Hand-Sealing: Malarkey shingles are manufactured with strips of a factory-applied, thermal sealant that is activated by the heat of the sun after the shingle is on the roof. Exposure to the sun's heat bonds each shingle to the one below for wind resistance.

A variety of conditions like cold weather, high winds or blowing dust, however, can affect the ability of the sealant strip to activate and prevent shingles from self-sealing during, or shortly after, installation. If shingles have not sealed after a reasonable time period, *hand-sealing* (also called hand-tapping) is strongly recommended.

Note: Malarkey's wind warranties apply only when shingles are sealed, whether by hand-sealing or activation of the self-sealing strips. Failure to seal under adverse circumstances like those described above is not a manufacturing defect.

To hand-seal a shingle, apply four (4) quarter-size dabs of asphalt roof cement conforming to ASTM D4586 evenly spaced under each shingle, and press shingles firmly into the cement. Excessive use may cause blistering; correct amounts should not bleed out from under the shingle. (See Figure 7)

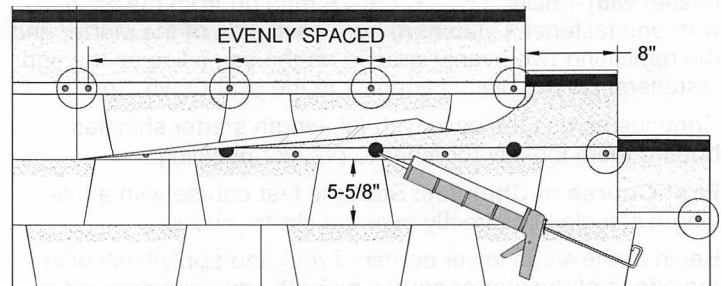


Figure 7 - Hand-Sealing Laminate Shingles

Steep Slope Fastening of Laminate Shingles: Roof decks with slopes greater than 21" (533 mm) per 12" (305 mm) require installation with six (6) fasteners per shingle and hand-sealing underneath.

Fasteners should be placed in the nailing area with end fasteners set approximately 1" (25 mm) in from each edge of the shingle and the remaining four (4) fasteners evenly spaced between. (See Figure 8)

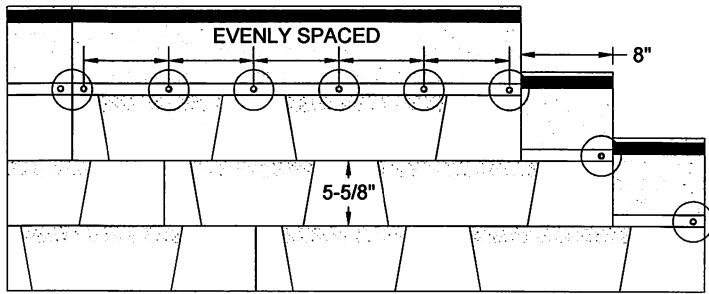


Figure 8 - Laminated, 6-Nail Fastening Pattern

Note: See Malarkey's *Shingle and Accessory Warranty* online for any additional requirements related to specific coverages.

SHINGLE PATTERN LAYOUT AND APPLICATION

Important: The diagonal application procedures described below are necessary to prevent objectionable patterning. Malarkey is not responsible for such patterning on roofs where this diagonal application is not used. Exposures should be even along the courses as well, or an objectionable appearance may occur.

Malarkey Smart Start™ Starter Shingles: Smart Start™ starter shingles are designed to be separated lengthwise at a perforation so you get two, full-size starter shingles in one. The perforation is in the middle of the shingle, 8³/₁₆" (208 mm) from each edge, and both pieces have seal-down strips. Besides eaves, it is recommended Smart Start™ starter shingles be installed on the rake edges of roof to provide a clean edge and increase wind resistance.

LAMINATE SHINGLE PATTERN LAYOUT (8" [203 MM] OFFSET, FIVE COURSE DIAGONAL METHOD)

Starter Course: Install Malarkey Smart Start™ starter shingles or use self-sealing 3-tab shingles with the tabs cut off. Ensure they are positioned with the factory-applied sealant strip face up and the strip adjacent to the eave edge of roof.

Cut 6" (152 mm) off one end of the first starter shingle, and lay it on a lower corner of the roof, overhanging the rake and eave edges by ¼" - ¾" (6-19 mm).

Fasten with 4 nails, 1½" - 3" (38-76 mm) up from the eave, with one fastener 1" (25 mm) from each side of the starter and the remaining two evenly spaced on the same line as the end fasteners. Do not place fasteners in the seal-down strip.

Continue across the eave with full-length starter shingles, butting them loosely together to prevent buckling.

First Course of Shingles: Start the first course with a full-length shingle laid directly over the starter course.

Begin at the same lower corner of roof and apply flush with the edges of the starter course on both eave and rake sides (maintaining the ¼" - ¾" [6-19 mm] roof overhang).

Fasten as described in the *Shingle Fastening* section above.

Second through Succeeding Courses: Start the second course with a shingle from which 8" (203 mm) has been cut from one end.

Position the remaining piece over the underlying, first course shingle, and align the bottom edge along a line level with the "sawtooth" overlay, leaving an exposure of 5%" (143 mm). Secure with fasteners.

Courses three through five are begun with partial shingles, each progressively 8" (203 mm) shorter, establishing the overall diagonal pattern. Pieces cut from shingles along the left rake can be used either to continue the diagonal installation pattern or finish off courses at the right rake.

Apply a full-length shingle adjacent to each of the first five courses to extend the pattern. Join the shingles loosely together to prevent buckling. Butt factory edge to factory edge when installing the stairstep method. This helps maintain a straight layout of the remaining shingles.

The sixth course begins again with a full length shingle, so repeat the 1-to-5 course cycle on up the roof.

Shingles may be laid from either lower corner of roof; follow layout and cutting instructions as required for proper application.

Note: Other shingle offsets are acceptable but no less than 4" (102 mm). Straight up application of shingles, or *racking*, is not recommended. (See **Figure 9**)

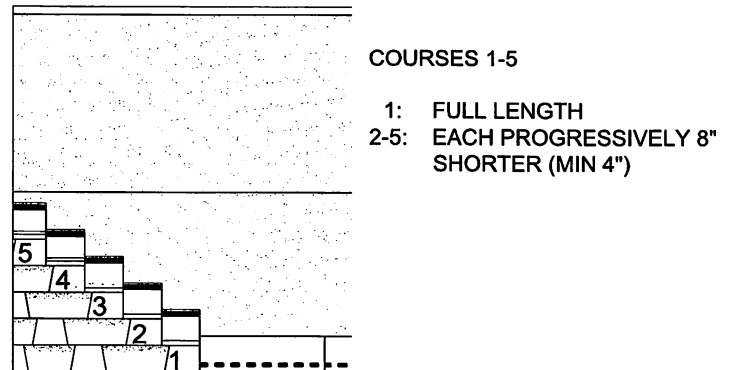


Figure 9 - Laminated Shingle Layout Pattern

CONSTRUCTING ROOF VALLEYS

Similar to a roof deck being prepared for shingles by first applying an underlayment, roof valleys must be likewise prepared before they can be "constructed" with shingles.

Closed-cut and *Open Metal Valley* applications are recommended for laminate shingles (instructions to follow); the *Open Membrane Valley* style is also acceptable.

Valley Underlayment: Center a full-width strip of self-adhering underlayment (or equivalent conforming to ASTM D1970) in the valley, and apply it directly to the roof deck. Ensure this *valley liner* is tight to the deck without bridging in the center of the valley.

Field underlayment can be woven across the valley liner and up the opposite side at least 12" (305 mm) or lapped over each side a minimum of 6" (152 mm). When fastening, be aware no fasteners are allowed within 6" (152 mm) of the valley centerline.

Valley underlayment must be in place for each method described next.

Closed-Cut Valley Construction: Lay a first course of shingles along the eave on one side of the roof, and continue it across the valley and onto the adjoining roof at least 12" (305 mm). Do not make a joint in the valley. Should a shingle fall short, add-in one or two tab sections so the joint falls outside the line of the valley.

Press the shingles well into the break of the valley, and nail using normal fastening methods, remembering no fasteners are allowed closer than 6" (152 mm) to the valley centerline.

Besides the nails used to secure the shingle, add another in the upper corner at the end of each shingle crossing the valley.

Repeat these procedures with the first course of shingles on the intersecting roof, extending it across the valley, over the top of the shingles laid before, and at least 12" (305 mm) onto the adjoining roof surface. Press into the valley, and fasten as before.

Note: The first course of shingles are the only ones woven in this fashion.

Return to the side of the roof you began with, and resume laying shingle courses across the valley and onto the adjoining roof at least 12" (305 mm). Complete the installation of shingles on that roof section.

Snap a chalk line 2" (51 mm) from the centerline of the valley on the unshingled side.

Begin applying shingle courses on the unshingled side, trimming them diagonally at the chalk line to match the centerline angle, and cropping the upper corner of the last shingle at a 1" (25 mm), 45 degree cut. Doing this will direct water into the valley.

Embed the ends of the cut valley shingles in a continuous 3" (76 mm) wide bead of asphalt roof cement conforming to ASTM D4586, and press them into the adhesive.

Complete the installation of shingles on that roof section. (See Figure 10)

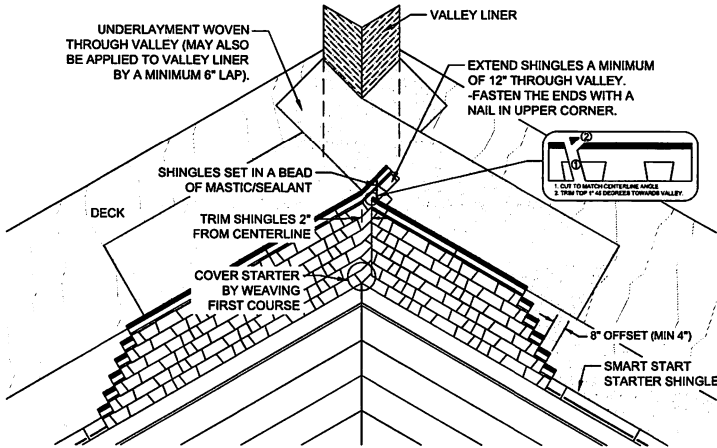


Figure 10 - Closed-Cut Valley Application

Open Metal Valley Construction: Metal valley flashing ("valley metal") used with Malarkey shingles must be minimum 24" (610 mm) wide and 26 gauge. Preformed, "W"-shaped flashing is recommended.

Center the valley metal over the valley liner, press it into the break of the valley, and secure with fasteners no more than 1" (25 mm) from the outside edges at a spacing of 10" (254 mm) to 12" (305 mm) O.C.

Set overlapping ends of the valley metal in a continuous bead of sealant, achieving a lap of 4" (102 mm). DO NOT FASTEN THE METAL LAP.

For additional sealing, a continuous 6" (152 mm) strip of self-adhering Arctic Seal® may be applied over the fasteners on each side of the metal liner.

Lay a first course of shingles along the eave of one roof section and over the valley, making sure the end of the last shingle reaches or goes beyond the centerline of the valley

metal. Never use a shingle trimmed to less than 12" (305 mm) in length to finish a course running into a valley. If necessary, trim a tab off the adjacent shingle in the course to allow a longer portion to be used.

Nail no closer than 6" (152 mm) to the centerline.

Complete the installation of shingles on that roof section.

After all shingles have been installed in the valley, snap a chalk line that extends out from the centerline on the shingled side a minimum of 2" (51 mm), and trim the shingle ends to the chalk line. Cut the ends diagonally to match the centerline angle, and crop the top of each shingle at a 1" (25 mm), 45 degree cut.

Embed the ends of the cut valley shingles in a continuous 3" (76 mm) wide bead of asphalt roof cement conforming to ASTM D4586, and press them into the adhesive.

Continue installing shingles on the adjoining roof as described above. (See Figure 11)

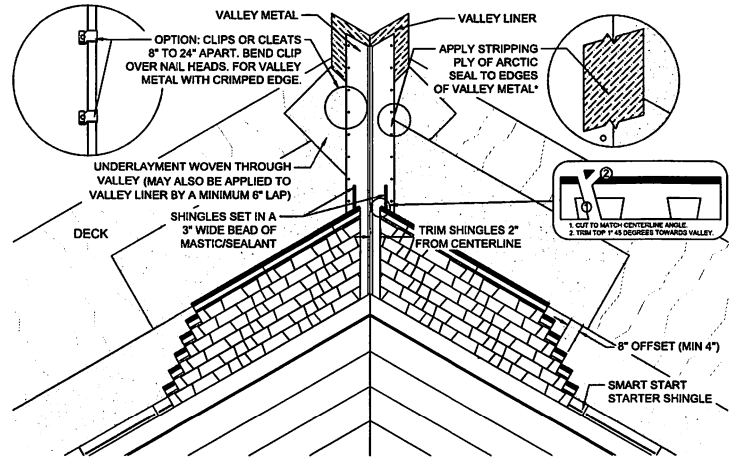


Figure 11 - Open Metal Valley Application

FLASHING APPLICATIONS

Intersections of Roof and Vertical Sidewall: Minimum 26-gauge, metal step flashing is used in the junction between a sloping roof and intersecting sidewall (on a dormer, for example) to protect this vulnerable area from moisture intrusion.

Step flashing can be square or rectangular, but 8-inch (203 mm) by 8-inch (203 mm) dimensions are common and satisfactory for our purposes.

Being 8" wide allows the flashing to be bent at 90 degrees and pushed against the transition of roof to wall, the horizontal flange extending 4" (127 mm) out onto the roof deck and the vertical flange, 4" (127 mm) up the wall assembly. Being 8" long allows individual step flashing pieces to overlap each other in water-shedding fashion as they are installed.

Individual step flashing pieces are integrated with each course of shingles as they are applied to intersect the sidewall. A 1/4" - 3/4" (6-19 mm) gap between the shingles and vertical bend of the flashing is recommended.

To allow for possible roof movement, fasten each piece of flashing to the roof deck and not the sidewall.

Installation is as follows: Atop the Smart Start™ starter course at the eave, place the first piece of flashing*. The horizontal flange should be flush with the eave edge of the starter and the vertical flange against the sidewall, counter-flashed by the wall cladding.

Fasten the horizontal flange of the step flashing to the roof deck with two nails placed 1" (25 mm) from the upper edge and spaced an equal distance apart.

Lay a first course shingle down on the roof, positioning it close to the sidewall but leaving a ¼" - ¾" (6-19 mm) gap between the end of the shingle and vertical bend in the step flashing. Fasten in place. The horizontal flange of the flashing will no longer be visible, but you can still see the vertical flange along the sidewall.

Place the second step flashing atop the first course shingle, and position it up from the eave edge of the shingle, matching the shingle exposure, and fasten as before.

Lay a second course shingle on the roof, position leaving a gap, and fasten.

Place the third step flashing atop that, overlapping the end of the previous step flashing at the point of shingle exposure (overlap is typically 2" [51 mm]).

Continue like this on up to the top of the sidewall intersection, alternating between the placement of step flashing and shingles.

* The "first piece of flashing" in this instance might well be "kickout" flashing, a piece of flashing cut and angled to direct water out and away from the side of a structure.

To accommodate the angled part, yet still serve as the initial piece of step flashing, the kickout will likely have a greater length than a regular piece of flashing. Otherwise, the installation of shingles and step flashing to follow is the same. (See Figure 12)

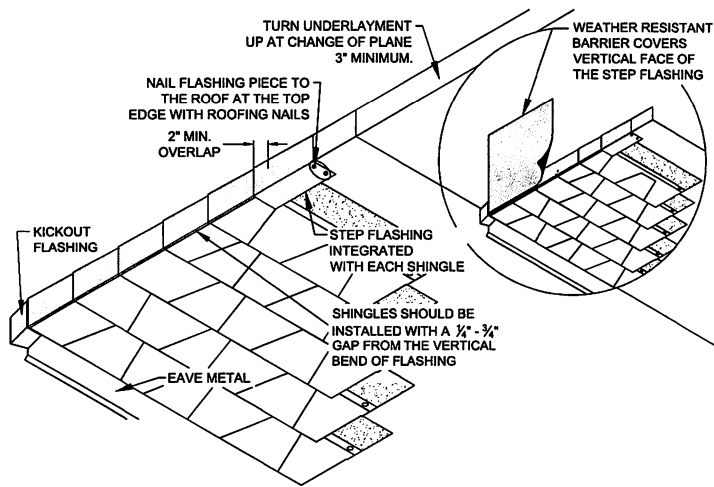


Figure 12 - Step Flashing Application at Roof-to-Sidewall Transitions

Vent Pipe (and Other Flanged Penetration) Flashing:

Install shingle courses up to the vent pipe, and cut a hole in the shingle to be positioned over the pipe. Install the pipe jack or boot (top and side flanges may be set in sealant).

Additional, *optional* weatherproofing: Unexposed pipe jack flanges (top and both sides) may also be stripped-off with minimum 6" (152 mm) wide Arctic Seal®, covering all fasteners used to secure the flanges, and tying onto the field underlayment a minimum of 3" (76 mm).

Continue roofing around the pipe, cutting shingles to fit on the sides and top of the pipe jack flanges. Ensure shingles extend beyond the downslope side of the pipe itself. Shingles that overlap any part of the flanges should be sealed to the flange

with asphalt roof cement conforming to ASTM D4586. Correct amounts should not bleed out from under the shingles; excessive use may cause blistering. Apply pressure to seal. (See Figure 13)

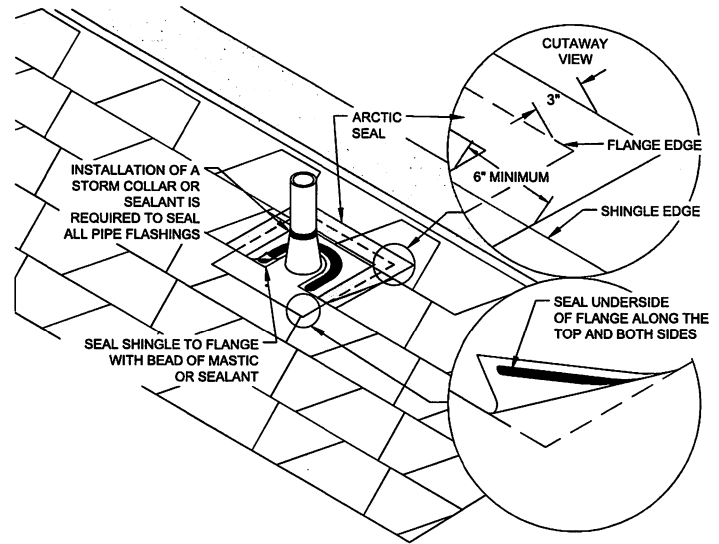


Figure 13 - Vent Pipe Flashing Application

Cap (Counter) and Chimney Flashings: The metal flashing apron for the front of the chimney shall be installed over the last course of shingles below the chimney and its vertical flange extending up the face of the chimney.

The metal flashings of chimneys, skylights, vents, and adjoining walls must be counter-flashed with sheet metal cap flashing.

Cap flashing (also called counter flashing) should originate in the masonry mortar joints of the chimney and be mortared-in or caulked with urethane sealant to ensure a watertight connection.

Cap flashing should then turn down the chimney and extend a minimum of 2" (51 mm) over the step flashings at all roof-to-sidewall intersections. (See Figure 14)

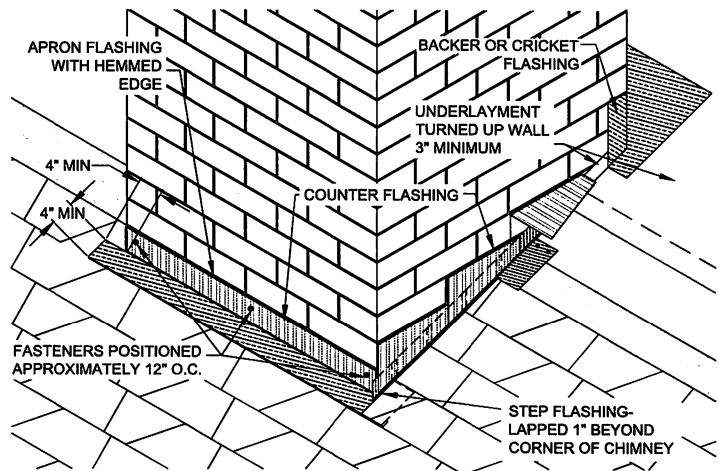


Figure 14 - Chimney Apron and Cap Flashing Applications

Chimney Saddles and Crickets: Apply Arctic Seal® self-adhering underlayment (or equivalent conforming to ASTM D1970) atop chimney saddles prior to the installation of flashing assemblies.

Flashing for chimney saddles and crickets shall be minimum 26-gauge galvanized or stainless steel, designed to cover the entire surface, and extend vertically 4" (102 mm) up the chimney.

Install a bead of mastic on the edges of chimney saddles and crickets. Press overlapping shingle courses into the mastic to seal. Seal all relief cuts and corners. (See Figure 15)

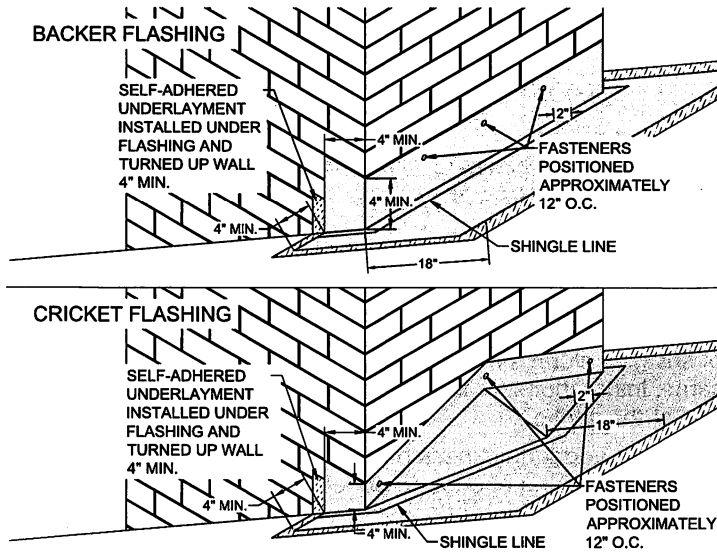


Figure 15 - Chimney Saddle and Cricket Flashing Applications

HIPS AND RIDGES

Factory-produced, Malarkey hip and ridge shingles are recommended for all Malarkey shingle roofs and required for expanded warranty coverage. Some contractors adapt 3-tab roofing shingles to use as hip and ridge shingles, but Malarkey only allows this when the field shingle is also a 3-tab shingle.

Shingles with Scotchgard™ Protector from 3M require hip and ridge shingles with Scotchgard™ Protector be installed with them. All four of Malarkey's hip and ridge shingle types feature this algae-resistant protection.

Malarkey hip and ridge shingles also include a factory-applied, thermally activated seal-down adhesive that provides additional protection against blow-off. When applied in cold weather or a windy location, however, it is recommended each ridge shingle be hand-sealed under each lower corner with a quarter-size spot of asphalt roof cement conforming to ASTM D4586.

To avoid damage to hip and ridge shingles in cold weather, Malarkey recommends warming them sufficiently to prevent damage during installation.

Apply Malarkey hip and ridge shingles beginning at the bottom of the hip or from the end of the ridge opposite the direction of prevailing winds.

Snapping a chalk line will help maintain a straight line while installing ridge shingles.

LOW-PROFILE INSTALLATION (10" AND 12" RIDGEFLEX™ HIP AND RIDGE SHINGLES)

Prepare for application by separating each hip and ridge shingle at the perforations: The 10" RidgeFlex™ produces four (4) individual hip and ridge strips (see Figure 16), and the 12" RidgeFlex™ produces three (3) (see Figure 17). Note the seal-down strips.

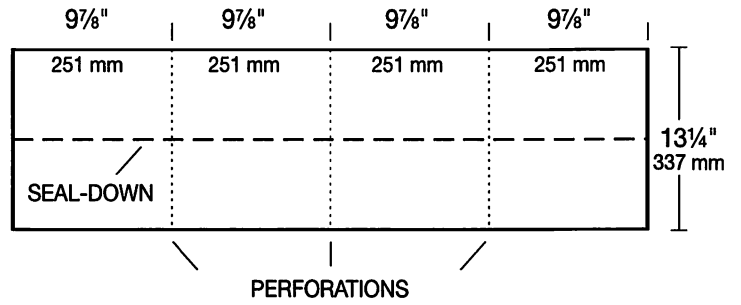


Figure 16 - 10" RidgeFlex™ Hip and Ridge Shingle

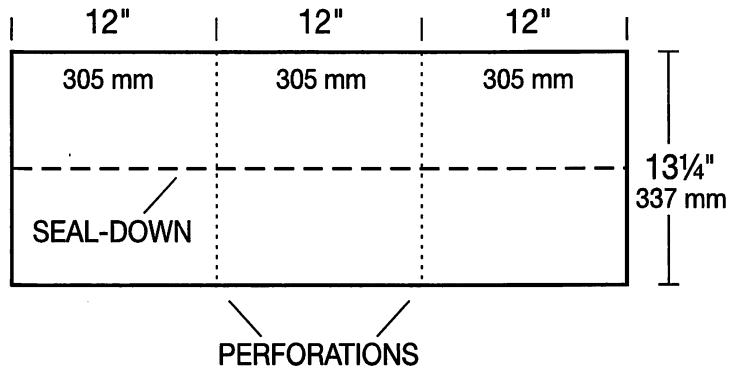


Figure 17 - 12" RidgeFlex™ Hip and Ridge Shingle

Each scored strip is 13¼" (337 mm) tall and has an exposure of 5⅝" (143 mm). You will be installing these individual pieces, and all are installed sealant side up.

Detail drawings to follow in this section show the installation of hip and ridge shingles along a roof ridge, but hips are essentially the same. Application begins at the bottom of the hip or from the end of the ridge opposite the direction of prevailing winds with a hip and ridge starter shingle.

RidgeFlex™ Starter Shingle: Create a starter shingle by cutting off the lower 5⅝" (143 mm) portion of a RidgeFlex™ shingle strip, and use the 7⅝" (194 mm) remainder as a starter. (See Figure 18)

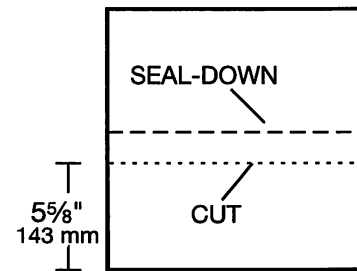


Figure 18 - RidgeFlex™ Shingle Strip for Use as a Hip and Ridge Starter Shingle

Apply the starter shingle (with seal-down strip adjacent to the roof edge) over the bottom corner of the hip or on either end of the ridge, overhanging the corner or end by ¼" - ¾" (6-19 mm), and bending the starter shingle along its centerline to form into place (ensure shingles are sufficiently warm to avoid cracking).

Fasten with two nails, approximately 3" (76 mm) back from the leading edge and 1" (25 mm) up from each side. (See Figure 19)

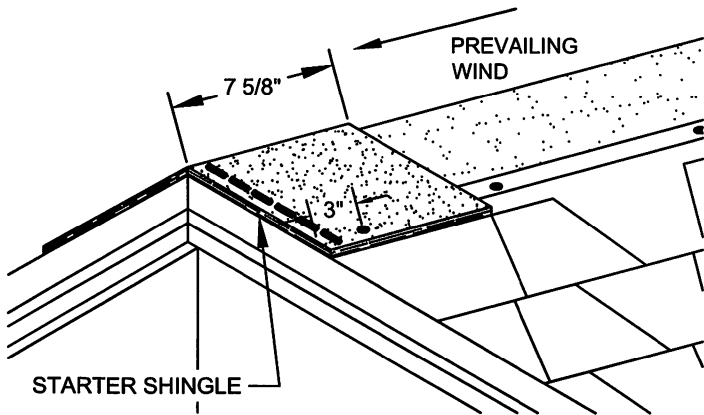


Figure 19 - Placement and Fastening of the RidgeFlex™ Starter Shingle

RidgeFlex™ Hip and Ridge Shingles: Lay the first RidgeFlex™ shingle strip on top of the starter shingle (maintaining the overhang). Fasten with two nails, 1" (25 mm) more than the designed exposure and 1" (25 mm) up from each side so succeeding hip and ridge shingles conceal nailheads.

Continue installing hip and ridge shingles, maintaining the exposure of 5 5/8" (143 mm) and fastening with one nail on each side and 1" (25 mm) up from the edge so succeeding shingles conceal nailheads. (See Figure 20)

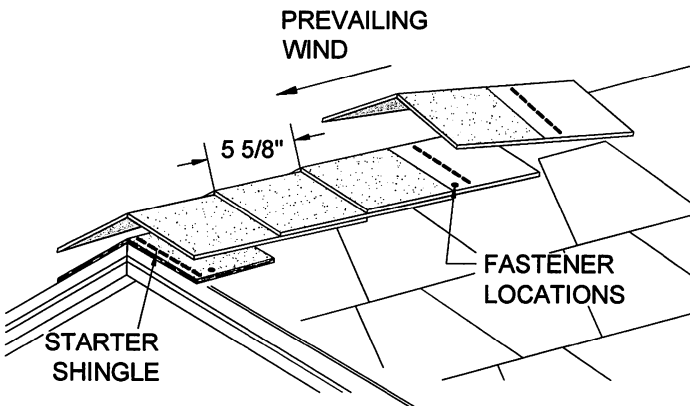


Figure 20 - Placement and Fastening of RidgeFlex™ Shingles, Maintaining the 5 5/8" Exposure

At the end of the ridge, cut a shingle strip, and use the lower 5 5/8" (143 mm) portion of a RidgeFlex™ shingle to create an *end cap*. Position to maintain the exposure of 5 5/8" (143 mm), and set the cap in asphalt roof cement conforming to ASTM D4586. Press down firmly to seal.

Should adverse conditions exist (like high winds), the end cap can also be face-nailed. Place two (2) nails on each side, 1" (25 mm) back from each end, and 1" (25 mm) up from the sides. Cover the nailheads with a dab of sealant. (See Figure 21)

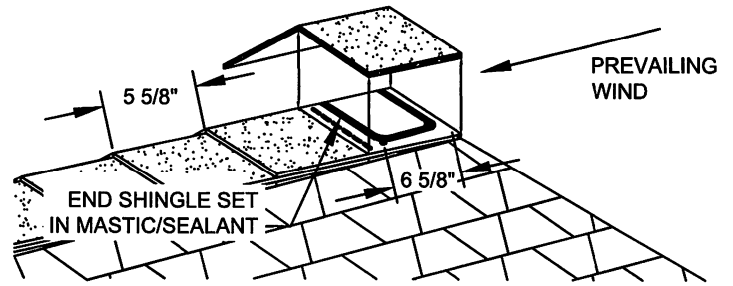


Figure 21 - Installation of RidgeFlex™ Shingles; End Cap Set in Mastic

HIGH-PROFILE INSTALLATION (EZ-RIDGE™ AND EZ-RIDGE™ XT HIP AND RIDGE SHINGLES)

Malarkey's EZ-Ridge™ is a high-profile hip and ridge shingle specially designed to accompany laminate and designer shingle applications.

Detail drawings to follow in this section show the installation of shingles along a roof ridge, but hips are essentially the same. Instructions for installing along rake edges are at the end of the section.

Given the added thickness of EZ-Ridge™ shingles, ensure your fasteners are long enough to penetrate all layers and at least 3/4" (19 mm) into the roof sheathing. Where the roof sheathing is less than 3/4" (19 mm) thick, the fasteners shall penetrate through the sheathing.

Application begins at the bottom of the hip or from the end of the ridge opposite the direction of prevailing winds with a hip and ridge *starter shingle*.

EZ-Ridge™ Starter Shingle: To create an EZ-Ridge™ starter shingle, cut off the 8 1/4" (210 mm) *exposure* portion of the shingle, and use the remaining 3 1/4" (83 mm) *cutout* portion (with sealant strip) as the starter. (See Figure 22)

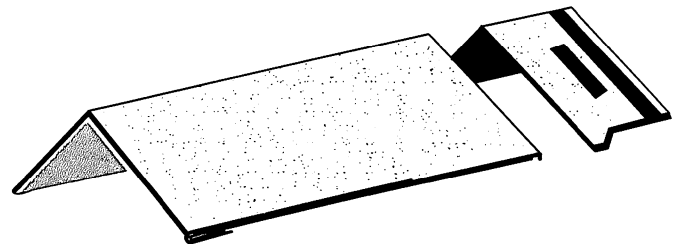


Figure 22 - Cutting an EZ-Ridge™ Shingle to Make a Hip and Ridge Starter Shingle

Save the exposure portion because it can be used as the end piece on the opposite end of the ridge.

Note: The longer strip on the end of an EZ-Ridge™ shingle is a film strip that prevents the shingles from sticking together while in the box they're packaged in. It is not designed to be removed.

Place the EZ-Ridge™ starter shingle flush to the rake at the peak, and position it so the seal-down strip is adjacent to the roof edge. Push down on the center of the shingle and adjust to fit the pitch of roof.

Fasten with two (2) nails, one (1) on each side, $\frac{3}{4}$ " (19 mm) behind the cutout and $\frac{1}{2}$ " (13 mm) up from the side. If installed correctly, fasteners should be covered by the overlying EZ-Ridge™ shingles to come, leaving none exposed.

EZ-Ridge™ Hip and Ridge Shingles: Apply a full-size EZ-Ridge™ shingle over the starter and overhang the end of the ridge by $\frac{1}{4}$ " - $\frac{3}{4}$ " (6-19 mm). Push down on the center of the shingle and adjust to fit the pitch of roof.

Fasten this shingle and those to follow with two (2) nails, one (1) on each side, $\frac{3}{4}$ " (19 mm) behind the cutout (not on the exposed part of the shingle) and $\frac{1}{2}$ " (13 mm) up from the side.

Continue installing EZ-Ridge™ shingles across the ridge, overlapping each with the side cutouts of the underlying shingle, and producing a consistent exposure of $8\frac{1}{4}$ " (210 mm). Fasten in the same manner as the first. (See Figure 23)

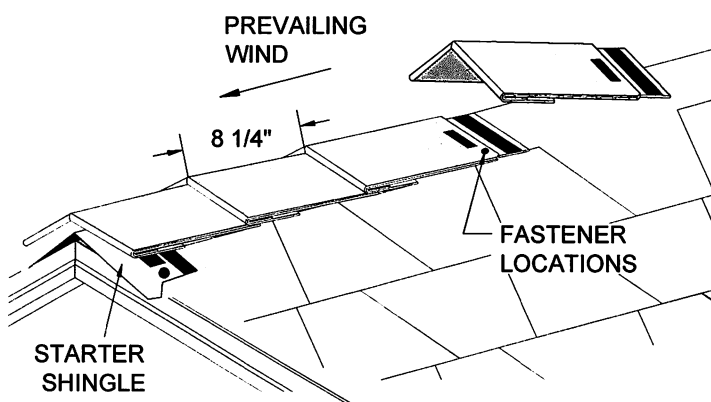


Figure 23 - Placement and Fastening of EZ-Ridge™ Shingles, Maintaining the $8\frac{1}{4}$ " Exposure

For the last hip and ridge shingle in the run, remove the cutout portion of an EZ-Ridge™ shingle and trim the exposure portion to fit or use the exposure portion of the shingle you cut earlier when creating the starter.

Set this *end cap* in asphalt roof cement, maintaining the $8\frac{1}{4}$ " (210 mm) exposure. (See Figure 24)

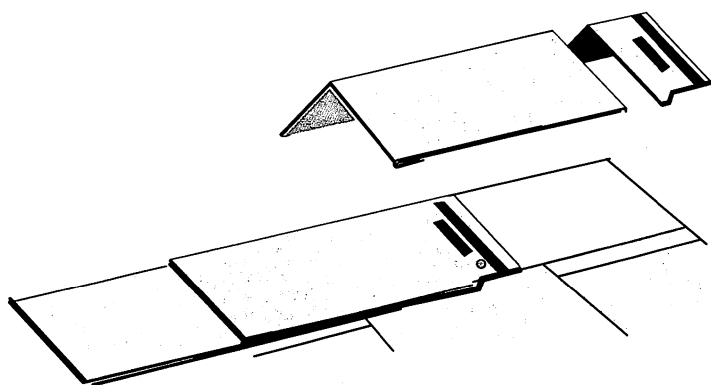


Figure 24 - EZ-Ridge™ Shingle Cut to Create an End Cap

Should adverse conditions exist (like high winds), the end cap can also be face-nailed. Place two (2) nails on each side, 1" (25 mm) back from each end, and 1" (25 mm) up from the sides. Cover the nailheads with a dab of sealant.

Note: The end cap can also be flipped around to preserve the high-profile appearance and give a finished look to the ridge. Position it to overhang the end of the ridge by $\frac{1}{4}$ " - $\frac{3}{4}$ " (6-19 mm). (See Figure 25)

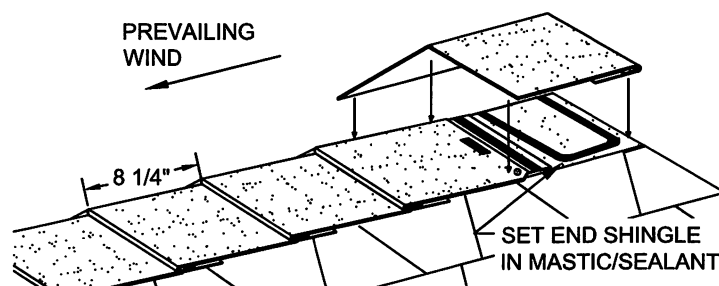


Figure 25 - Optional Positioning and Fastening of the EZ-Ridge™ End Cap

EZ-RIDGE™ RAKE EDGE INSTALLATION

Instructions are the same as those above with these exceptions:

1. Always start at the low end of the roof.
2. Have the high-profile, finished ends of EZ-Ridge™ shingles in the lowest position.
3. Note: Installation with exposed nails may affect the aesthetic appeal of EZ-Ridge™ shingles. (See Figure 26)

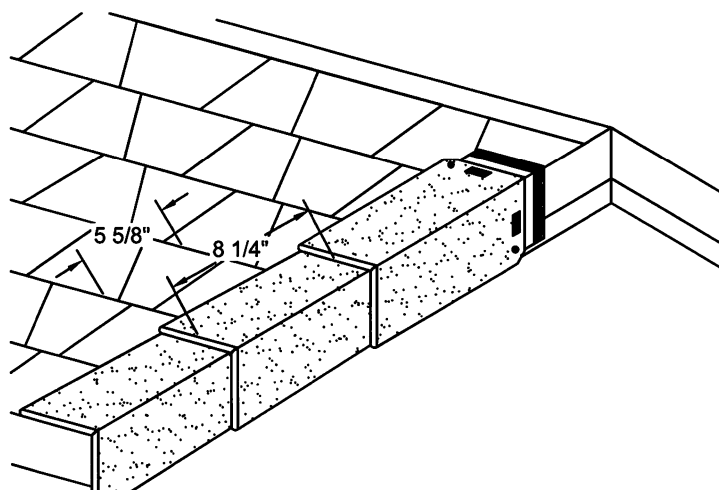


Figure 26 - Installation of EZ-Ridge™ Shingles on Rake Edges of the Roof

RE-ROOFING OVER EXISTING ASPHALT SHINGLES

For best performance and appearance, it is recommended old roofing be completely removed from the deck.

When roofing over existing asphalt shingles, *it is recommended only 3-tab shingles be overlaid*. Roofing over laminates creates an irregular surface across each course that may prevent the newly installed shingles from sealing down properly, leaving them more susceptible to wind damage.

In some areas, building codes do not require removal of old roofing if: 1) The existing shingles and framing will support the workers installing the roofing, the new roof itself, and required dead loads; and 2) The old wood deck is sound and able to provide good anchorage for nails.

Make the surface as smooth as possible by replacing missing shingles and securely nailing all buckles, raised tabs or curled shingles. Malarkey is not responsible for a potentially objectionable appearance of the new surface from any irregularity in the substrate caused by remaining roofing.

Additional ventilation should be provided, and longer nails will likely be necessary to penetrate a minimum of ¾" (19 mm) into the roof deck or completely through plywood or OSB sheathing.

Installing Class 3 or Class 4 impact resistant shingles over existing roofs negates their impact resistance and will not make them eligible for insurance discounts.

FINAL NOTE

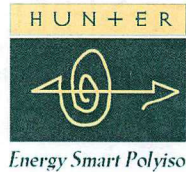
These instructions are meant to act as a general guide. If you have questions about this installation or any Malarkey roofing product, please contact our Technical Services Department weekdays at (800) 545-1191 or (503) 283-1191, 7:00 am to 5:00 pm Pacific Time. You can also email us at:

technicalinquiries@malarkeyroofing.com. Thank you.



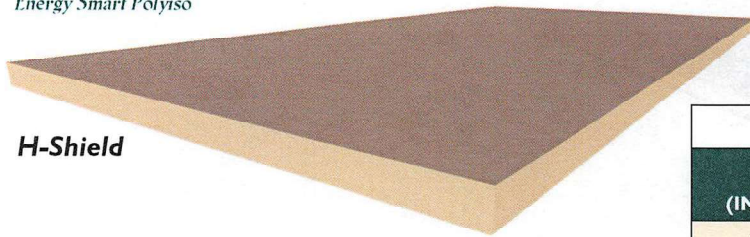
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Rev. 08/20



HUNTER PANELS H-SHIELD

Flat Polyisocyanurate Insulation



H-Shield

Description

H-Shield is a rigid roof insulation panel composed of a closed cell polyisocyanurate foam core manufactured on-line to fiber reinforced facers on each side (GRF).

Premium Performance Attributes

- Manufactured with NexGen Chemistry: Contains no CFCs, HCFCs, HFCs, is Zero ODP, EPA Compliant, and has virtually no GWP
- Approved for direct application to steel decks
- Approved under all major roof covering systems – BUR, Modified and Single-Ply

Applications

- Constructions requiring FM Class 1 and UL Class A ratings
- Single-Ply Roof Systems (Ballasted, Mechanically Attached, Fully Adhered)
- Standing Seam Metal Roof Systems
- Modified Bitumen Systems
- Built-Up Roofing: Asphalt and Coal Tar

Panel Characteristics

- Available in two grades of compressive strengths per ASTM C1289 Type II, Class 1 Grade 2 (20 psi) or Grade 3 (25 psi)
- Available in 4'x4' (1220mm x 1220mm) and 4'x8' (1220mm x 2440mm) panels in thicknesses of 1" (25mm) to 4.5" (114mm)
- Also available as special cut products - straight cut and flute fill. For more information please see Hunter Panels product data sheets for these products.

Potential LEED Credits for Polyiso Use

Energy and Atmosphere

- Optimize Energy Performance

Materials & Resources

- Building Life-Cycle Impact Reduction
- Environment Product Declaration
- Material Reuse
- Recycled Content
- Construction and Demolition Waste Management

Indoor Environmental Quality

- Thermal Comfort

H-SHIELD THERMAL VALUES

THICKNESS (INCHES)	(MM)	L T T R R VALUE*	FLUTE SPANABILITY
1.00	25	5.7	2 5/8"
1.50	38	8.6	4 3/8"
1.80	46	10.3	4 3/8"
2.00	51	11.4	4 3/8"
2.50	64	14.4	4 3/8"
2.60	66	15.0	4 3/8"
3.00	76	17.4	4 3/8"
3.50	89	20.5	4 3/8"
3.80	97	22.3	4 3/8"
4.00	102	23.6	4 3/8"
4.30	109	25.5	4 3/8"
4.50	114	26.8	4 3/8"

*Long Term Thermal Resistance Values are based on ASTM C 1289.

Codes and Compliances

- ASTM C 1289 Type II, Class 1 Grade 2 (20 psi) or Grade 3 (25 psi)
- International Building Code (IBC) Chapter 26
- State of Florida Product Approval Number FL 5968
- California Code of Regulations, Title 24, Insulation Quality Standard License #TI-1420
- Miami Dade County Product Control Approved

Underwriters Laboratories Inc Classifications

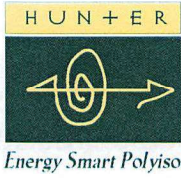
- UL 1256
- Insulated Steel Deck Construction Assemblies – No. 120, 123, 292
- UL 790
- UL 263 Hourly Rated P Series Roof Assemblies

UL Classified for use in Canada

- Refer to UL Directory of Products Certified for Canada for more details
- CCMC 13460-L
- UL Certified for Canada, CAN/ULC-S126, CAN/ULC-S101, CAN/ULC-S107
- CAN/ULC-S704 Type 2, Class 3 (20 psi) or Type 3, Class 3 (25 psi)

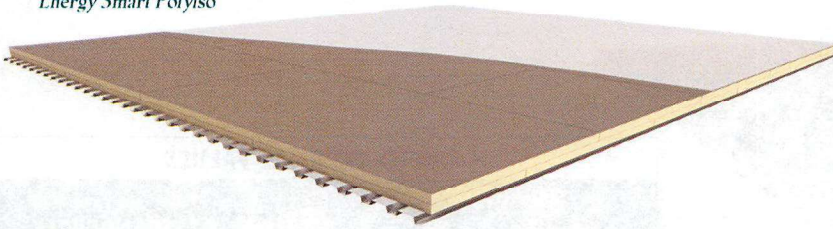
Factory Mutual Approvals

- FM 4450, FM 4470
- Approved for Class 1 insulated steel deck constructions for 1-60 to 1-270. Refer to FM Approval's RoofNav for details on specific systems



HUNTER PANELS H-SHIELD

Flat Polyisocyanurate Insulation



R-30.0, two layers of 2.6" H-Shield with Single-Ply membrane

H-SHIELD TYPICAL PHYSICAL PROPERTY DATA CHART POLYISO FOAM CORE ONLY		
PROPERTY	TEST METHOD	VALUE
Compressive Strength	ASTM D 1621	20 psi* (138kPa, Grade 2)
Dimensional Stability	ASTM D 2126	2% linear change (7 days)
Moisture Vapor Transmission	ASTM E 96	< 1 perm (57.5ng/(Pa•s•m ²))
Water Absorption	ASTM C 209	< 1% volume
Flame Spread**	ASTM E 84	< 75
Smoke Developed**	ASTM E 84	< 450
Service Temperature	-	-100° to 250° F (-73°C to 122°C)

*Also available in 25 psi, Grade 3
 **Meets the requirements of the IBC code. For specific Flame Spread or Smoke Developed Ratings please contact the Hunter Panels Technical Department

WARNINGS AND LIMITATIONS

Insulation must be protected from open flame and kept dry at all times. Install only as much insulation as can be covered the same day by completed roof covering material. Hunter Panels will not be responsible for specific building and roof design by others, for deficiencies in construction or workmanship, for dangerous conditions on the job site or for improper storage and handling. Technical specifications shown in this literature are intended to be used as general guidelines only and are subject to change without notice. For more information refer to the Storage and Handling Technical Bulletin at www.hunterpanels.com, or refer to PIMA Technical Bulletin No. 109: *Storage & Handling Recommendations for Polyiso Roof Insulation* at www.polyiso.org.

Single-Ply Systems

Ballasted Single-Ply Systems

Each H-Shield panel is loosely laid on the roof deck. Butt edges and stagger joints of adjacent panels. Install the roof covering according to the manufacturer's specifications.

Mechanically Attached Single-Ply Systems

Each H-Shield panel must be secured to the roof deck. Butt edges and stagger joints of adjacent panels. Install the roof covering according to the manufacturer's specifications.

Fully Adhered Single-Ply

Each H-Shield panel must be secured to the roof deck. Maximum 4'x4' (1220mm x 1220mm) panels of H-Shield may be adhered to a prepared concrete deck or subsequent layers of insulation with a full mopping of hot steep asphalt, insulation adhesive or cold applied mastic. Butt edges and stagger joints of adjacent panels. Install the roof covering according to the manufacturer's specifications.

Built Up, Coal Tar And Modified Bitumen Systems (APP, SBS)

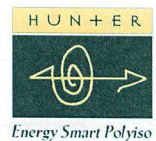
Each H-Shield panel must be secured to the roof deck. Maximum 4'x4' (1220mm x 1220mm) panels of H-Shield may be adhered to a prepared concrete deck or subsequent layers of insulation with a full mopping of hot steep asphalt, insulation adhesive or cold applied mastic. Butt edges and stagger joints of adjacent panels. Install the roof covering according to the manufacturer's specifications.

To achieve optimal thermal performance, Hunter Panels recommends installation of a multi-layered system with staggered joints.



Hunter Panels | Energy Smart Polyiso | 888.746.1114 | www.hunterpanels.com

New York Illinois Florida Texas Utah Pennsylvania Washington





Technical Service Hotline 1.800.225.6119 or
www.densdeck.com

Manufacturer

Georgia Pacific Gypsum Georgia-Pacific Canada
 133 Peachtree Street 2180 Meadowvale Boulevard, Suite 200
 Atlanta, GA 30303 Mississauga, ON L5N 5S3
 Technical Service Hotline: 1-800-225-6119

Description

DensDeck® Prime Roof Board has been enhanced to provide a broader compatibility and higher performance with roofing adhesives. Face mat enhancements allow adhesives to be applied more uniformly and consistently. In adhered, single ply membrane testing, enhanced DensDeck Prime demonstrated an average of 24% better bond than the original products, when using solvent based adhesives. (Average based on 60 sq.ft./gal coverage rates.)* Choose DensDeck Prime Roof Boards for adhered and self-adhered "peel & stick" roofing systems, as well as hot mopped, cold mastic and torch-applied modified bitumen roofs. Enhanced DensDeck Prime Roof Boards create a stronger and more economical installation by reducing the amounts of mastic or adhesive used and potentially eliminates the field primer. Consult with membrane manufacturer for actual priming requirements.

DensDeck Prime Roof Boards are the first and only fiberglass mat gypsum roof boards with a 90-day weather exposure limited warranty when applied vertically on a parapet wall.** (Limited to 1/2" and 5/8" products only.)

Primary Uses

Roof system manufacturers and designers have found DensDeck Prime Roof Board to be compatible with many types of roofing systems, including: modified asphalt, single-ply, metal systems, recover board, as well as an overlayment for polyisocyanurate and polystyrene insulation. DensDeck Prime Roof Board can also be used as a form board for poured gypsum concrete deck in roof applications as well as a substrate for spray foam roofing systems. 1/2" (12.7 mm) and 5/8" (15.9 mm) DensDeck Prime Roof Board may also be used in vertical applications as a backer board or liner for the roof side of parapet walls.

DensDeck Prime Roof Board may allow the bonding of cold mastic modified bitumen and torching directly to the surface. *Consult with the system manufacturer for recommendations on this application.*

DensDeck Prime Roof Board is the preferred substrate for vapor retarders.

Standards and Code Approvals

DensDeck Prime Roof Boards are manufactured to meet ASTM C1177 and have the following approvals:

- Florida Product Approved
- Miami-Dade County Product Control Approved

Recommendations and Limitations

DensDeck Prime Roof Boards are manufactured to act with a properly designed roof system following good roofing practices. The actual use of DensDeck Prime Roof Board as a roofing component in any system or assembly is the responsibility of the roofing system's design authority. Consult with the appropriate system manufacturer and/or design authority for system and assembly specifications and instructions on applying other products to DensDeck Prime Roof Board. Georgia-Pacific does not warrant and is not responsible for any systems or assemblies utilizing DensDeck Prime Roof Board or any component in such systems or assemblies other than DensDeck Prime Roof Board.

The need for a separator sheet between the DensDeck Prime Roof Board and the roofing membrane must be determined by the roof membrane manufacturer or roofing system designer.

* Testing was done in accordance with FM approvals 4470, Appendix C: Small Scale Tests, Membrane Delamination Tests for Roofing Membranes and Substrates Using Tensile Loading.

** For complete warranty details, visit www.DensDeck.com. (Limited to 1/2" and 5/8" products only.)

Confirm any priming requirements with the membrane manufacturer. When applying solvent-based adhesives or primers, allow sufficient time for the solvent to flash off to avoid damage to roofing components.

DensDeck Prime Roof Boards should not be subjected to abnormal or excessive loads or foot traffic, such as, but not limited to, use on plaza decks or under steel-wheeled equipment that may fracture or damage the panels. Provide suitable roofing system protection when required.

When using DensDeck Prime Roof Boards for hot-mopped applications, Georgia-Pacific recommends maximum asphalt application temperatures of 425°F (218°C) to 450°F (232°C). Application temperatures above these recommended temperatures may adversely affect roof system performance. Consult and follow the roofing system manufacturer's specifications for full mopping applications and temperature requirements.

When using DensDeck Prime Roof Board as a substrate for torch applications, ensure that the product is dry and that the proper torching technique is used. Limit the heat to the DensDeck Prime Roof Board. Maintain a majority of the torch flame directly on the roll.

Conditions beyond the control of Georgia-Pacific, such as weather conditions, dew, leaks, application temperatures and techniques may cause adverse effects with roofing systems.

Handling and Use—CAUTION

This product contains fiberglass facings which may cause skin irritation. Dust and fibers produced during the handling and installation of the product may cause skin, eye and respiratory tract irritation. Avoid breathing dust and minimize contact with skin and eyes. Wear long sleeve shirts, long pants and eye protection. Always maintain adequate ventilation. Use a dust mask or NIOSH/MSHA approved respirator as appropriate in dusty or poorly ventilated areas.

Moisture Management

DensDeck Prime Roof Boards, like other components used in roofing systems, must be protected from exposure to moisture before, during and after installation.

Remove the plastic packaging from all DensDeck Prime Roof Board immediately upon receipt of delivery. Failure to remove the plastic packaging may result in entrapment of condensation or moisture. DensDeck Prime Roof Board stored outside must be stored level and off the ground and protected by a breathable waterproof covering. Provide means for air circulation around and under stored bundles of DensDeck Prime Roof Board. DensDeck Prime Roof Board must be covered the same day as installed.

Avoid application of DensDeck Prime Roof Boards during rain, heavy fog and any other conditions that may deposit moisture on the surface, and avoid the overuse of non-vented, direct-fired heaters during winter months. When roofing systems are installed on new poured concrete or light weight concrete decks or when re-roofing over an existing concrete deck, a vapor barrier should be installed above the concrete to retard the migration of water from the concrete into the roof assembly. Always consult the roofing system manufacturer or design authority for specific instructions for applying other products to DensDeck Prime Roof Boards.

Moisture vapor movement by convection must be eliminated, and the flow of water by gravity through imperfections in the roof system must be controlled. After a leak has occurred, no condensation on the upper surface of the system should be tolerated, and the water introduced by the leak must be dissipated to the building interior in a minimum amount of time.

Although DensDeck Prime Roof Boards are engineered with fiberglass facings and high density gypsum cores, the presence of free moisture can have a detrimental effect on the performance of the product and the installation of roofing membranes. For example, hot asphalt applications can blister; torched modified bitumen may not properly bond; and adhesives for single ply membranes may not dry properly.

Submittal Approvals

Job Name _____

Contractor _____

Date _____

continued →

Stamps / Signatures

Moisture accumulation may also significantly decrease wind uplift and vertical pull resistance in the system or assembly. DensDeck[®] Prime Roof Boards containing excessive free moisture content may need to be evaluated for structural stability to assure wind uplift performance.

Fire Resistance Classifications

DensDeck Prime Roof Boards are excellent fire barriers over combustible and noncombustible roof decks, including steel decks.

UL 790 Classification. DensDeck Prime Roof Boards have been classified by Underwriters Laboratories LLC (UL) for use as a fire barrier over combustible and noncombustible decks in accordance with the ANSI/UL 790 and ULC CAN-S114 test standard. The UL classification includes a comprehensive Class A, B or C rating. For additional information concerning the UL 790 classification, consult the UL Certification Directory.

UL 1256 Classification. DensDeck Prime Roof Boards have also been classified by UL in roof deck constructions for internal (under deck) fire exposure in accordance with the ANSI/UL 1256 Steiner Tunnel test. For additional information concerning the UL 1256 classification, consult the UL Certification Directory.

FM Class 1 Approvals. DensDeck Prime Roof Boards are included in numerous roofing assemblies with a Factory Mutual (FM) Class 1 fire rating. 1/4" (6.4 mm) DensDeck

Prime Roof Boards have passed testing under the FM Calorimeter Standard 4450 and have been approved by FM as such for insulated steel deck roofs when installed according to the conditions identified by FM. For more information concerning FM Approvals and FM Class 1 assemblies with DensDeck Prime Roof Boards, consult FM or RoofNav[®]

Type X. 5/8" (15.9 mm) DensDeck[®] Prime Fireguard[®] Roof Boards are manufactured to meet the "Type X" requirements of ASTM C1177 for increased fire resistance beyond regular gypsum board.

UL Fire Resistance Ratings. 5/8" (15.9 mm) DensDeck Prime Fireguard Roof Boards are designated as **Type DD** by UL and included in assembly designs investigated by UL for hourly fire resistance ratings. 5/8" (15.9 mm) DensDeck Prime Fireguard Roof Boards may also replace any unclassified 5/8" (15.9 mm) gypsum board in an assembly in the UL Fire Resistance Directory under the prefix "P".

Flame Spread and Smoke Developed. When tested in accordance with ASTM E84, DensDeck Prime Roof Boards had Flame Spread 0, Smoke Developed 0.

Wind Uplift

DensDeck Prime Roof Boards are included in numerous assemblies evaluated by FM or other independent laboratories for wind uplift performance. For information concerning such assemblies, please visit www.roofnav.com.

Physical Properties

Properties	1/4" (6.4 mm)	1/2" (12.7 mm)	5/8" (15.9 mm)
Thickness, nominal	1/4" (6.4 mm) ± 1/16" (1.6 mm)	1/2" (12.7 mm) ± 1/32" (.8 mm)	5/8" (15.9 mm) ± 1/32" (.8 mm)
Width, standard	4' (1219 mm) ± 1/8" (3 mm)	4' (1219 mm) ± 1/8" (3 mm)	4' (1219 mm) ± 1/8" (3 mm)
Length, standard	4' (1219 mm) and 8' (2438 mm) ± 1/4" (6.4 mm)	4' (1219 mm) and 8' (2438 mm) ± 1/4" (6.4 mm)	4' (1219 mm) and 8' (2438 mm) ± 1/4" (6.4 mm)
Weight, nominal, lbs./sq. ft. (Kg/m ²)	1.2 (5.9)	2.0 (9.8)	2.5 (12.2)
Surfacing	Fiberglass mat with non-asphaltic coating	Fiberglass mat with non-asphaltic coating	Fiberglass mat with non-asphaltic coating
Flexural Strength ¹ , parallel, lbf. min. (N)	≥ 40 (178)	≥ 80 (356)	≥ 100 (444)
Flute Spanability ²	2-5/8" (66.7 mm)	3" (127 mm)	8" (203 mm)
Permeance ³ , Perms (ng/Pa•S•m ²)	>30 (>1710)	>23 (>1300)	>17 (>970)
R Value ⁴ , ft ² •°F•hr/BTU (m ² •K/W)	.28	.56	.67
Linear Variation with Change in Temp., in/in °F (mm/mm/C°)	8.5 x 10 ⁻⁶ (15.3 x 10 ⁻⁶)	8.5 x 10 ⁻⁶ (15.3 x 10 ⁻⁶)	8.5 x 10 ⁻⁶ (15.3 x 10 ⁻⁶)
Linear Variation with Change in Moisture	6.25 x 10 ⁻⁶	6.25 x 10 ⁻⁶	6.25 x 10 ⁻⁶
Water Absorption ⁵ , % max	5	5	5
Compressive Strength ⁶ , psi nominal	900	900	900
Surface Water Absorption, grams, nominal	1.0	1.0	1.0
Flame Spread, Smoke Developed (ASTM E84)	0/0	0/0	0/0
Bending Radius	4' (1219 mm)	6' (1829 mm)	8' (2438 mm)

1. Tested in accordance with ASTM C473 method B.
 2. Tested in accordance with ASTM E661.
 3. Tested in accordance with ASTM E96 (dry cup method).

4. Tested in accordance with ASTM C518 (heat flow meter).
 5. Specified values per ASTM C1177.
 6. Tested in accordance with ASTM C473.

PLEASE PROVIDE FASTENING PATTERN!



U.S.A. GP Gypsum LLC
 Canada Georgia-Pacific Canada LP

SALES INFORMATION AND ORDER PLACEMENT

U.S.A. West: 1-800-824-7503
 Midwest: 1-800-876-4746
 South Central: 1-800-231-6060
 Southeast: 1-800-327-2344
 Northeast: 1-800-947-4497

CANADA Canada Toll Free: 1-800-387-6823
 Quebec Toll Free: 1-800-361-0486

DENSDECK 1-855-647-3325

TECHNICAL INFORMATION

U.S.A. and Canada: 1-800-225-6119, www.gpgypsum.com

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WARRANTIES, REMEDIES AND TERMS OF SALE For current warranty information for this product, please go to www.gpgypsum.com and select the product for warranty information. All sales of this product by Georgia-Pacific are subject to our Terms of Sale available at www.gpgypsum.com.

UPDATES AND CURRENT INFORMATION The information in this document may change without notice. Visit our website at www.gpgypsum.com for updates and current information.

CAUTION For product fire, safety and use information, go to www.buildgp.com/safetyinfo or call 1-800-225-6119.

FIRE SAFETY CAUTION Passing a fire test in a controlled laboratory setting and/or certifying or labeling a product as having a one-hour, two-hour, or any other fire resistance or protection rating and, therefore, as acceptable for use in certain fire rated assemblies/systems, does not mean that either a particular assembly/system incorporating the product, or any given piece of the product itself, will necessarily provide one-hour fire resistance, two-hour fire resistance, or any other specified fire resistance or protection in an actual fire. In the event of an actual fire, you should immediately take any and all actions necessary for your safety and the safety of others without regard for any fire rating of any product or assembly/system.