

Nailbase No. 4001

Subject: Fastening Requirements for Sloped Roofs

Date: March 2008 (Revised January 2019)

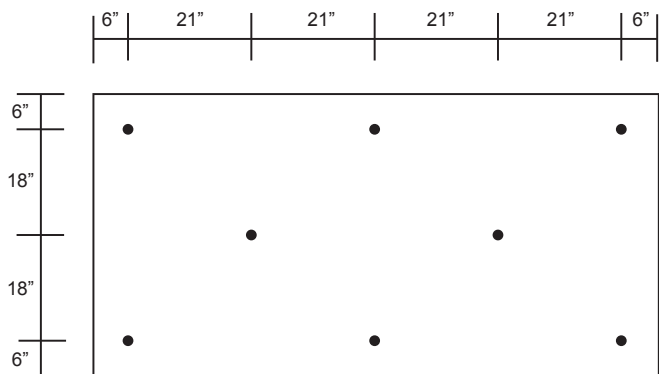
Minimum fastening requirements for ThermaFoam R-Control Nailbase have been calculated in accordance with ASCE 7-05 Method 2, Exposure C, Importance factor of 1.0, a maximum roof height of 60 ft. For projects with snow loads and wind speeds in excess of 110 mph, consult a professional engineer for fastening requirements.

Field of Roof										
Number of Fasteners for 4' x 8' (1.2m x 2.4m) Nailbase										
Total Load (Snow Load + Dead Load)	Roof Slope									
	3/12	4/12	5/12	6/12	7/12	8/12	9/12	10/12	11/12	12/12
30 psf	8	8	8	8	8	8	8	8	8	8
40 psf	8	8	8	8	8	8	8	8	12	12
50 psf	8	8	8	8	12	12	12	12	12	12
60 psf	8	8	8	12	12	12	12	12	12	12
70 psf	8	8	12	12	12	12	16	16	16	16
80 psf	8	12	12	12	16	16	16	16	16	16
90 psf	8	16	16	16	16	16	16	16	16	16

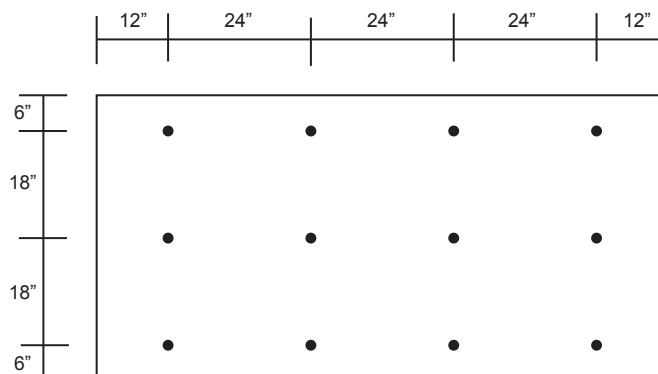
Perimeter of Roof										
Number of Fasteners for 4' x 8' (1.2m x 2.4m) Nailbase										
Total Load (Snow Load + Dead Load)	Roof Slope									
	3/12	4/12	5/12	6/12	7/12	8/12	9/12	10/12	11/12	12/12
30 psf	16	16	16	16	8	8	8	8	8	8
40 psf	16	16	16	16	8	8	8	8	12	12
50 psf	16	16	16	16	12	12	12	12	12	12
60 psf	16	16	16	16	12	12	12	12	12	12
70 psf	16	16	16	16	12	12	16	16	16	16
80 psf	16	16	16	16	16	16	16	16	16	16
90 psf	16	16	16	16	16	16	16	16	16	16

The values in the tables are applicable to ThermaFoam R-Control Wood Screws when installed into a SPF or equal wood deck (min. 1" penetration) and to ThermaFoam R-Control Metal Deck Screws when installed into a steel deck (22 min. gauge).

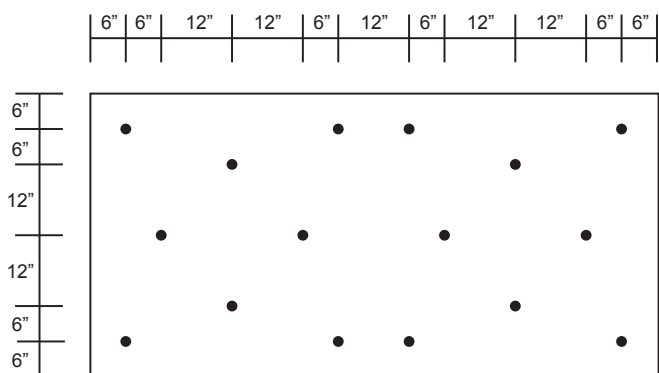
Fastening Patterns for 4' x 8' Nailbase



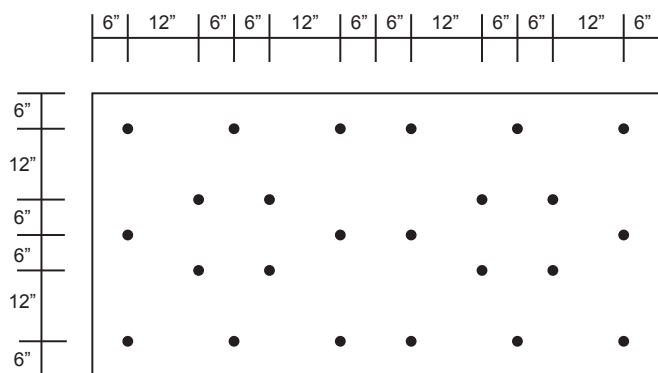
8 Fasteners/Bd.



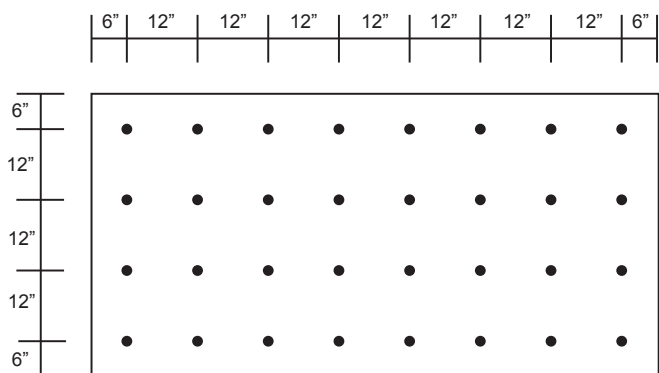
12 Fasteners/Bd.



16 Fasteners/Bd.



24 Fasteners/Bd.



32 Fasteners/Bd.



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1450 N. Waco St.
Hillsboro, Texas 76645

254-324-7477
(SIPS)



sales@rcontrolsips.com

TECH BULLETIN NAILBASE

Nailbase No. 4002

Subject: Asphalt Shingles

Date: February 2009 (Revised January 2019)

GAF, a leader in the manufacture of shingles, has examined the use of their asphalt shingles with ThermaFoam R-Control Nailbase substrates and have authored the attached Technical Advisory Bulletin. GAF has served notice that their products applied directly over ThermaFoam R-Control Nailbase substrates are acceptable and that no restrictions will be placed on their warranty.

GAF's shingles are recommended as the preferred asphalt shingle product for use with ThermaFoam R-Control Nailbase substrates.

When using shingles other than GAF, please contact your asphalt shingle manufacturer to clarify their warranty coverage when applied over ThermaFoam R-Control Nailbase.



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254-324-7477
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TECHNICAL ADVISORY BULLETIN

To: GAF Residential Sales, GAF Contractors, GAF Field Services

From: Technical Services Department

Subject: Acceptable Substrate For GAF Asphalt Shingle Applications



Quality You Can Trust...
From North America's
Largest Roofing Manufacturer!™

Date: 07/31/2014

No: TAB-R 2011-101-R1

Why Is The Substrate So Important?

A shingle roof substrate is the “foundation” for your roofing system. The substrate provides the smooth structural base on which asphalt shingles are installed. If the substrate is inferior, the integrity of the roofing system may be compromised.

What's Considered A “Standard Deck” For Shingles?

Standard decks include:

- **Plywood or OSB...** 3/8” minimum thickness, exterior grade as recommended by APA – The Engineered Wood Association
- **Wood planking...** Nominal 1” thick (min.) x 6” wide (max.) wood planking, with a maximum 1/8” spacing at the ends and sides

Note: For existing older installations, if spacing is $> 1/8” \leq 1/4”$, install a double layer of underlayment. If the spacing is greater than 1/4” install a layer of 3/8” minimum thickness APA labeled exterior grade plywood or OSB over the wood planking.

Can The Other Substrates Be Used Without Prior Approval?

When properly installed using the fasteners and construction design recommended by the deck manufacturer, the following substrates may be used:

- GAF Cornell ThermaCal® 1 Ventilating Roof Insulation Panels
- GAF Cornell ThermaCal® 2 Ventilating Roof Insulation Panels
- Loadmaster Shingle Deck
- Tech Shield or equivalent Radiant Barrier Decking systems with vapor permeable, perforated foil backing
- Ainsworth's Thermastrand Radiant Barrier
- 2” Minimum Homasote or Thermasote (Homasote Co.)
- 2” Minimum Span Rock Gypsum Plank (USG) – fasteners must have a minimum 40 lbs. of pullout
- Vented-R (Atlas)
- Vented Nail-Line (Apache)
- Hunter Vented Nail Base
- Foam-Control Nail Base (AFM Corp. Licensed Mfr.)
- Tectum III, Tectum E and Tectum NS (Tectum, Inc.)
- Huber Zip Deck System – A waterproof underlayment such as StormGuard® leak barrier must be used at eaves as required by code or for certain warranty considerations and additional underlayment may be needed on slopes less than 4:12 or on re-roofing projects.

Note: GAF shingles are **not** approved for applications directly over any insulation or fiberboard.

What About Structural Insulated Panels (SIP)?

SIP may be use when:

- Approved/rated by UL for use as a shingle roof deck
- With the minimum thickness of plywood or OSB as recommended above installed in accordance with the SIP panel manufacturers recommendations for use as a shingle roof deck

What About Codes?

Roof decks must meet local codes... and approval from the local building department should be obtained to confirm the deck construction and ventilation meets local code requirements.

Is The Substrate Or Workmanship Covered Under GAF Warranties?

Only GAF Cornell ThermaCal® 1 & 2 Ventilating Roof Insulation Panels are covered by GAF under the GAF Cornell ThermaCal® Nail Base Roof Insulation Limited Warranty. See this limited warranty for complete coverage and restrictions.

All substrates must be installed in accordance with the deck manufacturer's specifications. Roof deck installation instructions, including the need for a vapor retarder, for specific deck types must be obtained from the respective manufacturer. GAF does not warrant the installation method, the performance of the decking or problems with the shingles caused by the deck or substrate, including but not limited to: physical movement, thermal bridging and/or moisture migration at the joints.

Where Can I Get More Information?

GAF Technical Services can assist you... with these and other questions you may have regarding your new roof installation. GAF Technical Services can be contacted at **800-ROOF-411** (800-766-3411). Also, the GAF website is a great resource for just about any question you may have or for additional information you may require. Please visit: www.gaf.com.

Nailbase No. 4003

Subject: Metal Roof Ventilation with Enkamat 7020

Date: September 2009 (Revised January 2019)

The ventilation of metal roofing when installed over ThermaFoam R-Control Nailbase is a recommended procedure that provides a number of building science benefits.

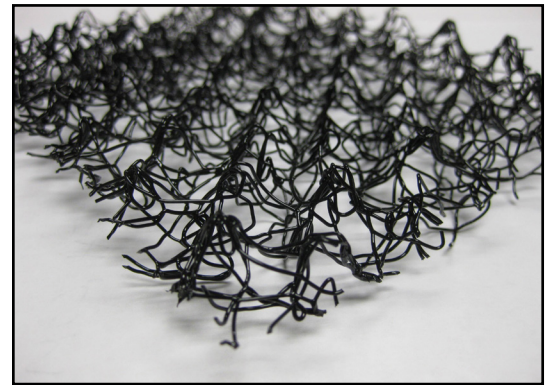
The primary benefit of venting above ThermaFoam R-Control Nailbase is the removal of unintended moisture vapor that may emanate from the interior of the building. The venting of moisture vapor between the roof covering and the top of the ThermaFoam R-Control Nailbase reduces the risk of condensation and the potential of moisture damage. In addition to the venting of interior moisture, any rainwater or melting snow that circumvents the metal roofing materials is also removed by virtue of the ventilation space.

Additional benefits of a ventilation cavity is the reduction in the temperature of the ThermaFoam R-Control Nailbase upper surface which reduces the cooling loads for a roof system in the summer. Some metal roofing systems, particularly Zinc and Copper, can expose ThermaFoam R-Control Nailbase roof decks to high temperatures and this reduction of temperature is required. In winter, the ventilated space assists by reducing ice dams when the depth of snow is significant. Impact noise of rain and hail are mitigated as well.

ThermaFoam R-Control has investigated a unique product that is compatible and works well with ThermaFoam R-Control Nailbase for above deck ventilation - Colbond's Enkamat 7020. Enkamat 7020 is commonly used in roofing applications to provide the ventilation, drainage, and thermal separation needed for a long service life.

Enkamat 7020 is a three-dimensional mat made of continuous nylon filaments fused at their intersections. The 95% open structure of the entangled filaments facilitates drying of condensed water vapor from the building interior while giving full support to the metal roof. The nylon filaments do not fail under

the load of the roof and the rigors of the construction environment, including construction foot traffic. The space created between the ThermaFoam R-Control Nailbase roof deck and the roof covering will allow moisture to flow away or evaporate.



Enkamat 7020 from Colbond

Testing has been conducted on the temperature difference that ThermaFoam R-Control Nailbase experiences when ventilated with Enkamat 7020 compared to no ventilation. A standing seam metal roof on a small scale ThermaFoam R-Control Nailbase roof structure was constructed specifically for this evaluation. Dark standing seam metal roof panels were fixed to the roof over the Enkamat 7020/roofing underlayment combination and this was compared to the metal roof panels over roofing underlayment alone.

The top surface of the metal roofing was brought to a temperature of 194°F (90°C) with the use of infrared heat lamps. This temperature was held for 6 hours to ensure the temperatures through the assembly would stabilize.

ThermaFoam R-Control Nailbase Ventilation	Temp Reduction From Metal Roof to Top Surface of ThermaFoam R-Control Nailbase
None	10°F
Enkamat 7020	43°F

The temperature recorded on the top surface of the ThermaFoam R-Control Nailbase was significantly lower with the use of the Enkamat 7020.

These results clearly demonstrate the effect of an air space on the temperature of an ThermaFoam R-Control Nailbase roof deck when metal roofing is exposed to high temperatures and solar exposure.

ThermaFoam R-Control recommends Colbond's Enkamat 7020 as a product that provides the important benefit of easy, cost effective installation with ThermaFoam R-Control Nailbase and the additional building science benefits of ventilation.



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1450 N. Waco St.
Hillsboro, Texas 76645

254-324-7477
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Nailbase No. 4004

Subject: Fastening to Concrete or Fully-Grouted Concrete Masonry Walls

Date: April 2010 (Revised January 2019)

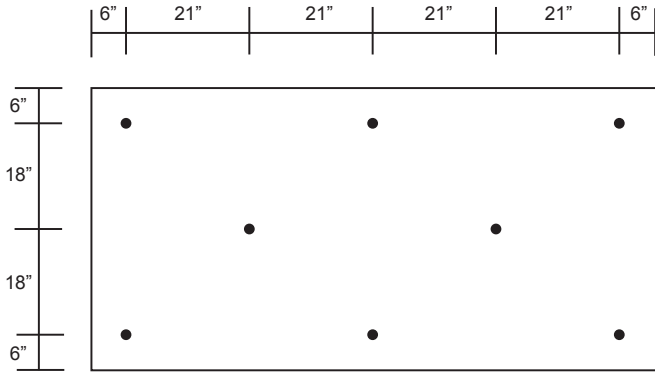
Minimum fastening requirements for ThermaFoam R-Control Nailbase attached to concrete or fully-grouted concrete masonry walls with 1/2" (12.7mm) diameter Titen HD® screws have been developed in cooperation with Simpson Strong-Tie Anchor Systems. Various numbers of fasteners per 4' x 8' ThermaFoam R-Control Nailbase panel provide for a range of allowable loads that ThermaFoam R-Control Nailbase could support when installed flush over a concrete or fully-grouted concrete masonry wall. Examples of uniformly distributed loads that ThermaFoam R-Control Nailbase could support include gypsum board or other interior finish materials. Non uniform loads from cabinets, interior fixtures, or plant equipment are not covered in the table and shall be supported using additional fasteners attached to the concrete or fully-grouted concrete masonry wall.

ThermaFoam R-Control Nailbase Walls - Uniformly Distributed Loading attached with 1/2" (12.7mm) diameter Titen HD® Screws into Concrete or Fully-Grouted Concrete Masonry ¹⁻⁷	
Number of Fasteners ⁶	Allowable Load, psf (kPa)
8	13 (0.62)
12	34 (1.63)
16	52 (2.49)

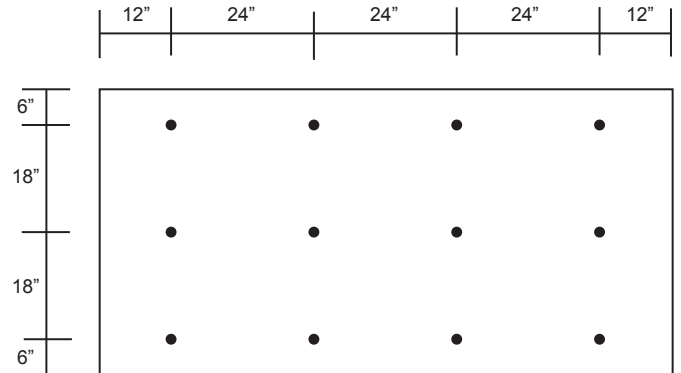
1. Applicable to 4' x 8' ThermaFoam R-Control Nailbase up to 5" thick.
2. The minimum anchor embedment is 2-3/4".
3. The minimum wall thickness is 8" for fully-grouted concrete masonry and 5" for concrete.
4. For installations in fully-grouted concrete masonry, the minimum distance from the anchor to any vertical mortar joint is 1.5" and the minimum distance to any edge on the face of the wall is 6". For installations in concrete, the minimum distance to any edge of the face of the wall is 6".
5. Values do not consider the application of positive or negative pressures (such as wind).
6. Please refer to page 2 of this bulletin for fastening patterns.
7. Building Codes may require special inspection of anchors installed in concrete or masonry. For compliance with these requirements, it is necessary to contact the local and/or regional authority having jurisdiction.

Titen HD® is a registered trademark of Simpson Strong-Tie Anchor Systems.

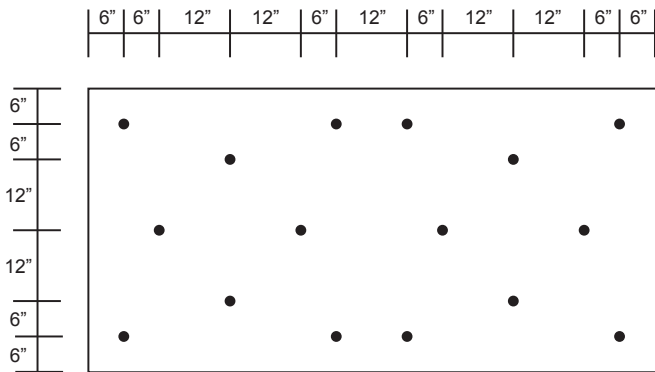
Fastening Patterns for 4' x 8' Nailbase



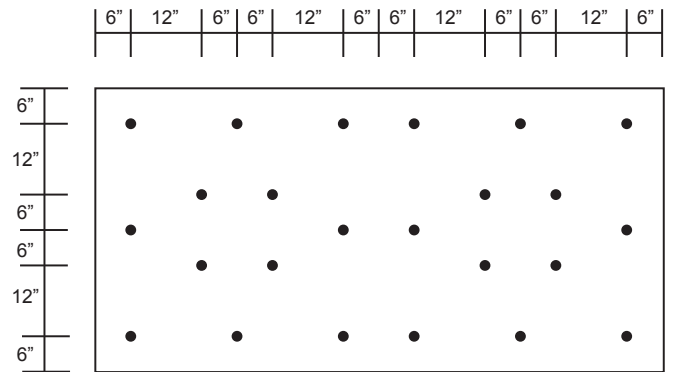
8 Fasteners/Bd.



12 Fasteners/Bd.



16 Fasteners/Bd.



24 Fasteners/Bd.



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1450 N. Waco St.
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254-324-7477
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Nailbase No. 4005

Subject: Fastening to Concrete or Masonry Walls

Date: April 2010 (Revised January 2019)

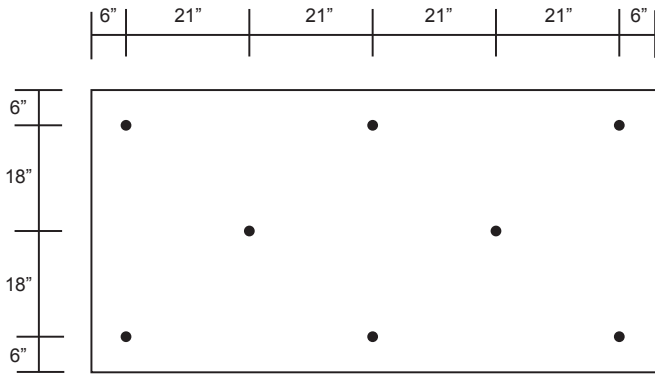
Minimum fastening requirements for ThermaFoam R-Control Nailbase attached to concrete or masonry walls with 1/4" (4.8mm) diameter Titen® screws have been developed. Various numbers of fasteners per 4' x 8' ThermaFoam R-Control Nailbase panel provide for a range of allowable loads that ThermaFoam R-Control Nailbase could support when installed flush over a concrete or masonry wall. Examples of uniformly distributed loads that ThermaFoam R-Control Nailbase could support include gypsum board or other interior finish materials. Non uniform loads from cabinets, interior fixtures, or plant equipment are not covered in the table and shall be supported using additional fasteners attached to the concrete or CMU wall.

ThermaFoam R-Control Nailbase Walls - Uniformly Distributed Loading (attached with 1/4" (4.8mm) diameter Titen Screws ¹⁻⁶)	
Number of Fasteners ⁶	Allowable Load, psf (kPa)
	Concrete or Masonry
8	3 (0.14)
12	14 (0.67)
16	30 (1.44)
24	85 (4.07)

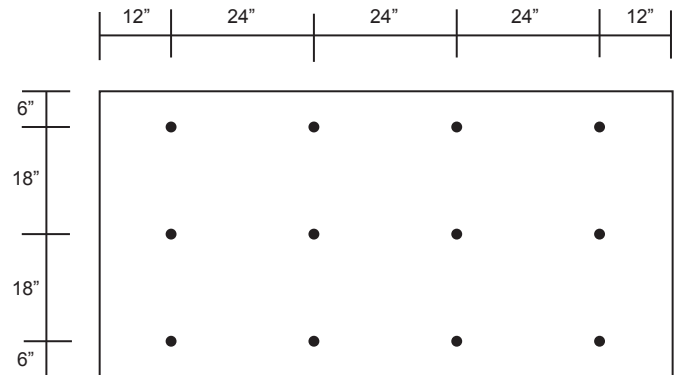
1. Applicable to 4' x 8' ThermaFoam R-Control Nailbase up to 5" thick.
2. Minimum anchor embedment is 1" (25.4 mm) and maximum anchor embedment is 1-1/2" (38.1 mm).
3. Concrete must be minimum depth of 1.5 x embedment.
4. Critical edge distance is 1-1/2" (38.1 mm) to edge of concrete or masonry block.
5. Table does not consider positive or negative pressures (such as wind). In cases where this is a design consideration, the use of washers is recommended.
6. Please refer to page 2 of this bulletin for fastening patterns.

Titen® is a registered trademark of Simpson Strong-Tie Anchor Systems.

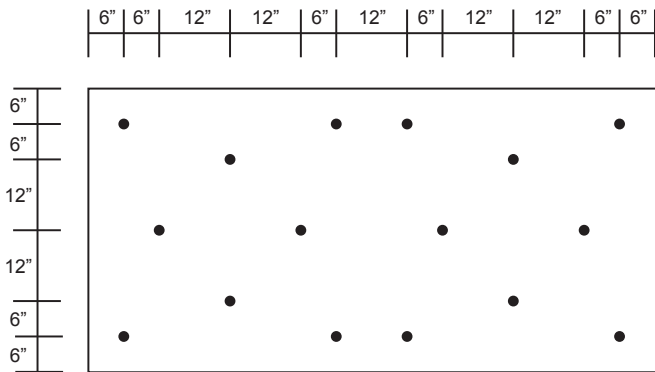
Fastening Patterns for 4' x 8' Nailbase



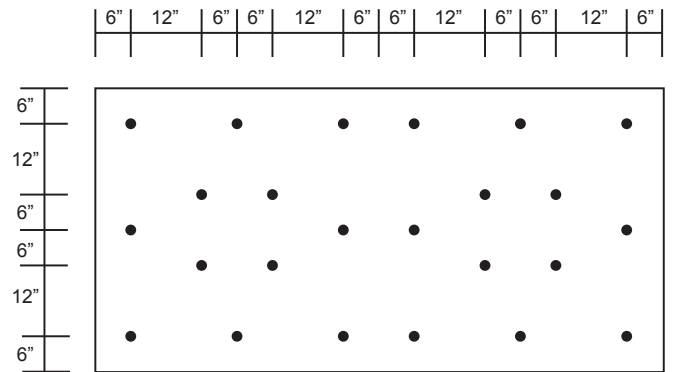
8 Fasteners/Bd.



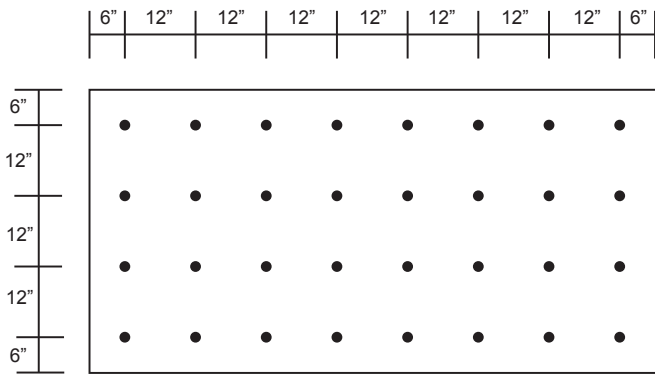
12 Fasteners/Bd.



16 Fasteners/Bd.



24 Fasteners/Bd.



32 Fasteners/Bd.



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1450 N. Waco St.
Hillsboro, Texas 76645

254-324-7477
(SIPS)



sales@rcontrolsips.com

NailBase No. 4006

Subject: Ventilation Accessory Products

Date: July 2011 (Revised January 2019)

Metal-Era, a leader in roof ventilation systems, provides a wide range of ventilation products for roof systems. Hi-Perf ridge vents and Hi-Perf vented fascia are two key products offered by Metal-Era that are suitable for use with ThermaFoam R-Control Nailbase Vent-1 and Vent-2. Metal-Era offers a wide range of technical service for designing a properly balanced system with appropriate net free area (NFA) to ensure optimum service life.

Metal-Era Hi-Perf ventilation products are recommended as the preferred product for use with ThermaFoam R-Control Nailbase Vent-1 and Vent-2.

Attached to this bulletin is introductory information on Metal-Era's Intake & Exhaust Roof Ventilation Systems. Please visit www.metalera.com for complete information on Metal-Era products for use with ThermaFoam R-Control Nailbase Vent-1 and Vent-2.

When using ventilation products other than Metal-Era, please contact the ventilation product manufacturer for installation recommendations and technical support.



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Build in *Performance* with Metal-Era's Intake & Exhaust Roof Ventilation Systems

Marcy Townhall | Marcy, NY

Hi-Perf Vented Fascia
Vented Nailbase Version

Hi-Perf Ridge Vent
Slope to Slope Version

Hi-Perf Ridge Vent
Slope to High Wall Version



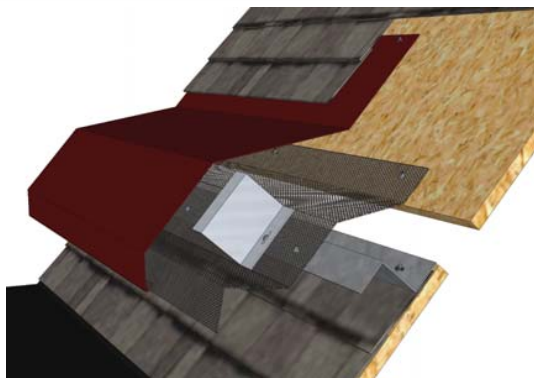
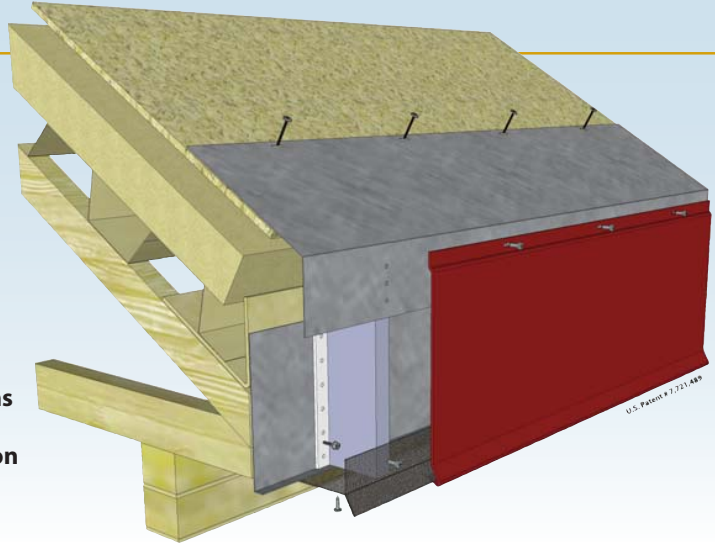
Individually Engineered for Your Project

Since 1980, Metal-Era has offered unequalled service in the industry, and has provided a wide selection of engineered roof edge and roof ventilation systems designed to meet the roofing industry's strictest standards. Airflow Solutions was developed to create a standard method of intake and exhaust ventilation for commercial roofs. The Hi-Perf line is the only solution on the market to ensure constant intake and exhaust airflow underneath the roof covering of commercial buildings.

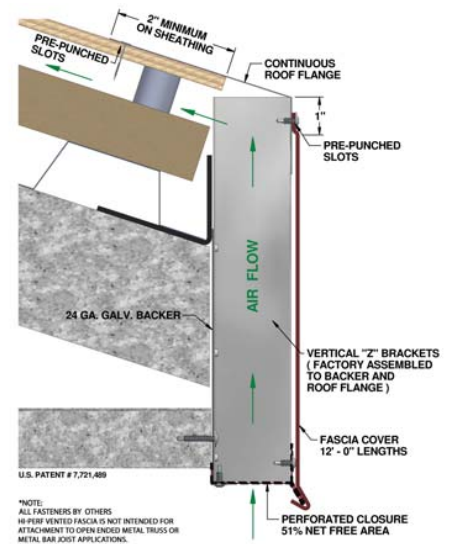
Intake Ventilation

Build in Performance

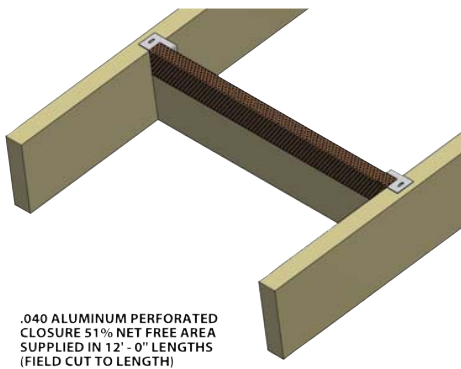
- 20 Year, 120 mph Warranty - Only Ventilation & Wind Warranty in the Industry
- Standard NFAs from 12 in.²/lf to 42 in.²/lf with Custom Designs Available for Larger NFAs
- All Metal, Commercial-Grade Design with Multiple Cover Options
- Works with All Vented Nailbase & Attic Applications
- Supplied in 12' Lengths for Quick & Easy Installation



Hi-Perf Intake Vent
for use when eave venting is not possible



Hi-Perf Vented Fascia
Vented Nailbase (shown) & Attic Vented Versions



Hi-Perf Truss Vent

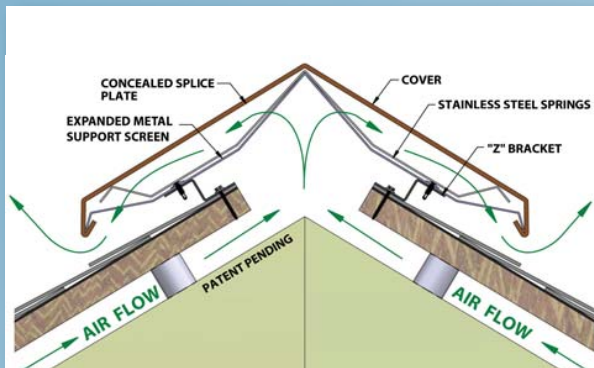
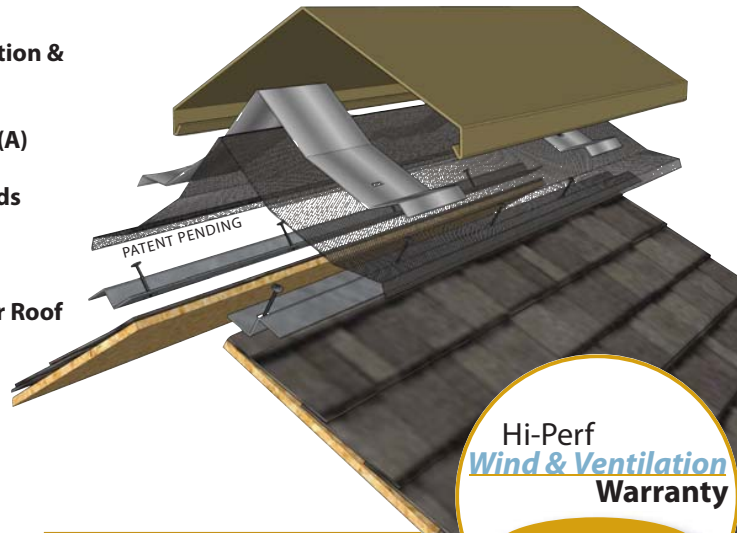


Exhaust Ventilation

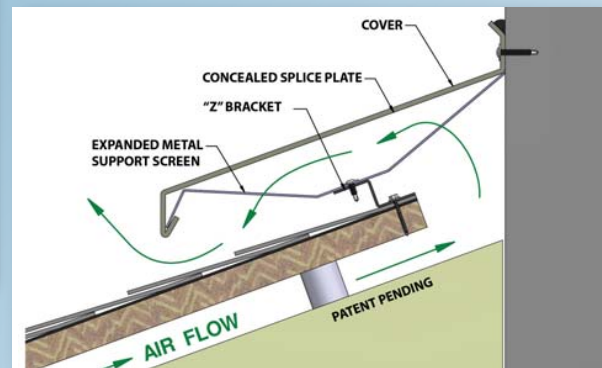
Hi-Perf Ridge Vents

Build in Performance

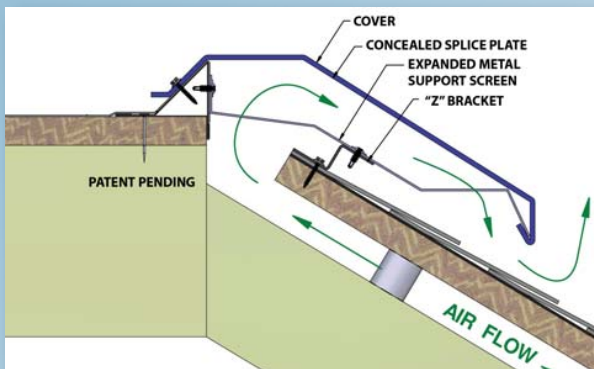
- 20 Year, 120 mph Warranty - Only Ventilation & Wind Warranty in the Industry
- Tested for Wind Driven Rain per TAS 100 (A)
- Engineered to Project's Specific NFA Needs
- Snap-On Cover
- Works with Shingles, Metal Roofs & Other Roof Coverings
- Easy Installation with 12' Lengths



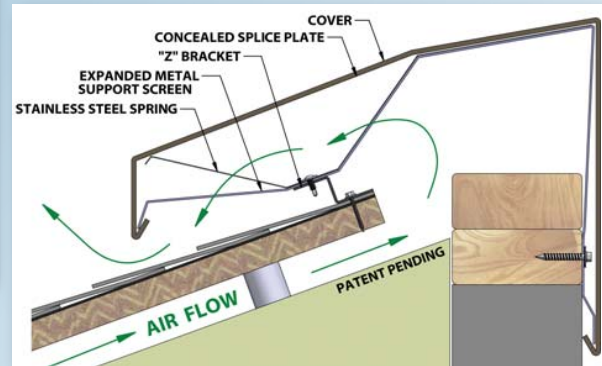
Slope to Slope Version



Sloped Roof Meets High Wall Version



Sloped Roof Meets Flat Roof Version



Sloped Roof Meets Vertical Wall Version

THE
**ONLY PERFORMANCE
 WARRANTED SOLUTIONS AVAILABLE**

A Complete, Balanced System

Proper roof ventilation is critical to the **longevity and effectiveness of the roof system**. Commercial buildings have several unique features, including:

- Larger structures
- Longer runs
- Larger surface area of the roof
- Lower pitches
- Larger heating and cooling systems, which are often placed on the roof

All of these characteristics impact the ventilation of the roof and should influence proper product selection.

Achieving **the right amount of net free area (NFA)** for your project will ensure performance and longevity, as well as provide cost savings.

Metal-Era and independent, third-party research confirms that the amount of **air space** underneath the roof sheathing **directly impacts roof performance**. Most products on the market are designed for residential applications. As a result, they often don't provide the necessary amount of NFA for larger structures to create a balanced system with both intake and exhaust venting.

Hi-Perf roof ventilation solutions are **designed to work in harmony with each other to create a balanced system**.

Achieving the proper airflow underneath the roof covering will contribute to a **cool roof system**, providing numerous sustainable benefits, including:

- Lower heating and cooling costs
- Increased life of the roof covering
- The elimination of moisture build-up
- Reduced threat of mold and mildew problems
- The elimination of dangerous and damaging ice dams

Download our **LEED white paper at www.metalera.com** to learn more about how Hi-Perf Vented Fascia and Ridge Vent can help you earn LEED credits.

For more information, resources and ventilation calculators:

www.metalera.com

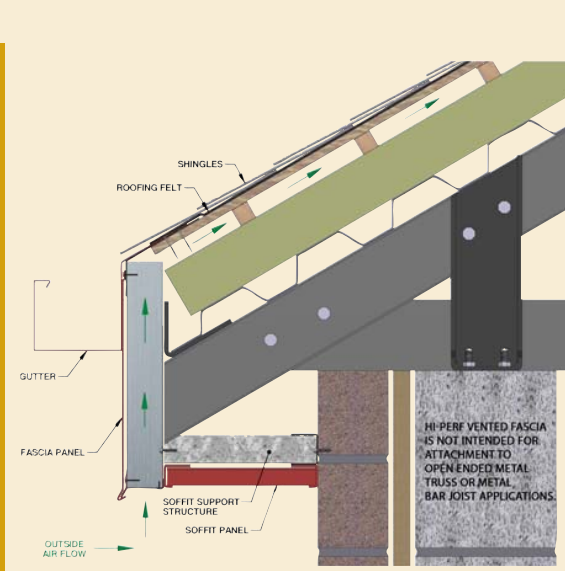
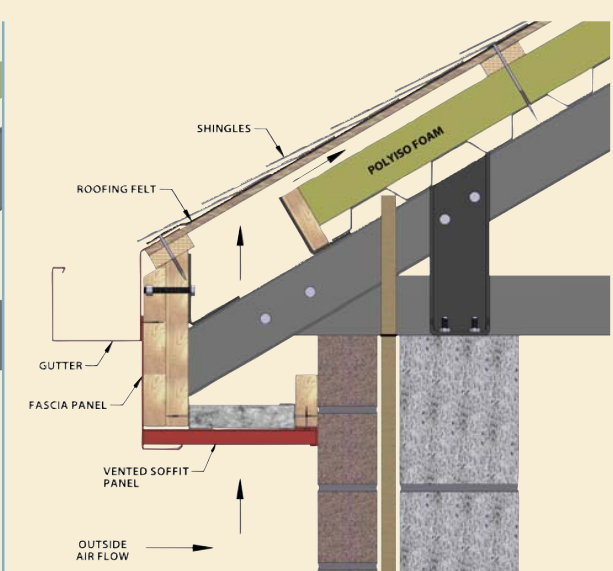
Build in Performance

- Complete Balanced Solution for Commercial Roof Systems
- Solutions for Challenging & Unique Designs
- NFA is Specifically Calculated to Meet Your Project's Needs
- Contributes to a Cool Roof System
- 20 Year, 120 mph Warranty - Only Ventilation & Wind Warranty in the Industry



There's No Comparison

When comparing Hi-Perf Vented Fascia to typical eave ventilation details, it's easy to see how Hi-Perf will save you time and money, all the while guaranteeing superior performance. With Hi-Perf you *know* you'll get a solution that works because **Metal-Era builds in performance.**

	
<h3>Hi-Perf Vented Fascia</h3>	<h3>Typical Construction</h3>
<p>Airflow Guarantees proper airflow at the eave for the unique needs of each project, thereby preserving the roof covering by helping create a cool roof system</p>	<p>Results vary depending on construction; no assurances that proper airflow will be provided</p>
<p>Wood Blocking No wood blocking or vented soffits required, thereby reducing costly, inconsistent field labor, and it is non-combustible</p>	<p>Typical wood blocking applications are inconsistent, costly and may be combustible</p>
<p>Trades Reduces the number of trades involved, thus consolidating responsibility</p>	<p>Many trades involved causing decentralized responsibility</p>
<p>Design A single factory manufactured & engineered product serves the needs of multiple products; simple designs for easy installation & consistent performance</p>	<p>Design varies in quality & performance; multiple components & products required</p>
<p>Warranty & Testing Carries a 20 Year, 120 mph Wind & Ventilation Warranty</p>	<p>No warranty available</p>

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Cover Photo

Architect: Peter Monterose,
McDonald & Monterose
Architects



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Nailbase No. 4007

Subject: Fastening to Concrete

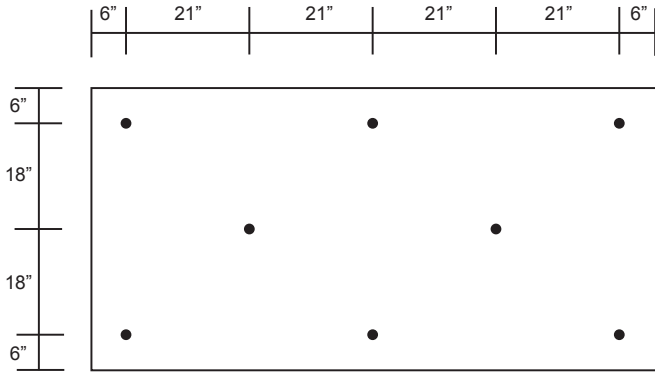
Date: May 2012 (Revised January 2019)

Minimum fastening requirements for ThermaFoam R-Control Nailbase attached to concrete with Hilti X-U power actuated fasteners have been developed in cooperation with Hilti. Various numbers of fasteners per 4' x 8' ThermaFoam R-Control Nailbase panel provide for a range of allowable loads that ThermaFoam R-Control Nailbase could support when installed flush over a concrete. Examples of uniformly distributed loads that ThermaFoam R-Control Nailbase could support include gypsum board or other interior finish materials. Non uniform loads from cabinets, interior fixtures, or plant equipment are not covered in the table and shall be supported using additional fasteners attached to the concrete.

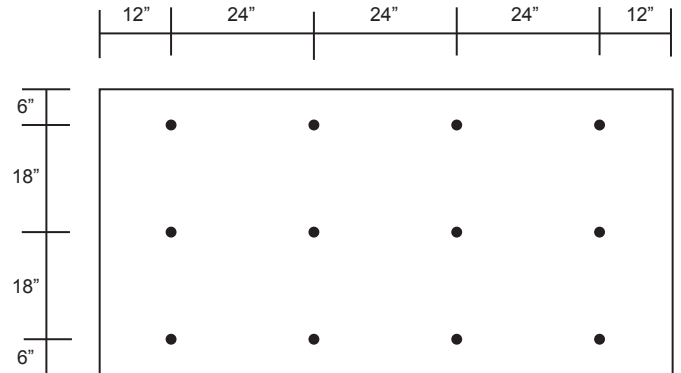
ThermaFoam R-Control Nailbase Walls - Uniformly Distributed Loading attached with Hilti X-U72 S36 fasteners into Concrete ¹⁻⁵	
Number of Fasteners	Allowable Load, psf (kPa)
8	15 (0.71)
12	23 (1.08)
16	30 (1.41)

1. Applicable to 4' x 8' ThermaFoam R-Control Nailbase up to 2" thick.
2. The minimum distance from the fastener to any edge of the face of the wall is 6".
3. Values do not consider the application of positive or negative pressures (such as wind).
4. Please refer to page 2 of this bulletin for fastening patterns.
5. Building Codes may require special inspection of anchors installed in concrete. For compliance with these requirements, it is necessary to contact the local and/or regional authority having jurisdiction.

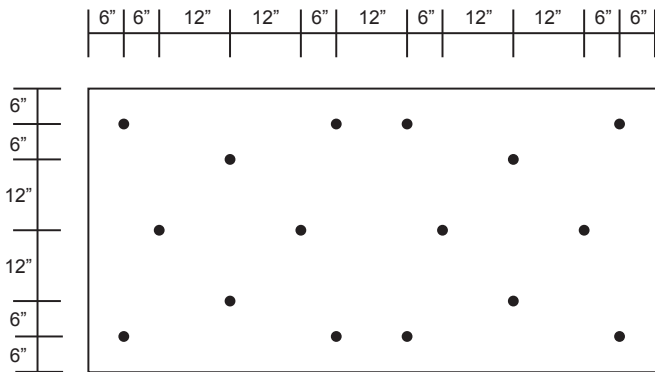
Fastening Patterns for 4' x 8' Nailbase



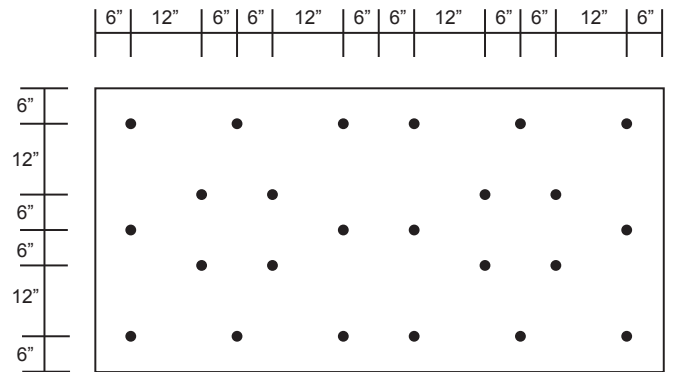
8 Fasteners/Bd.



12 Fasteners/Bd.



16 Fasteners/Bd.



24 Fasteners/Bd.



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