H-SHIELD NB
INSTALLATION AND
DESIGN CRITERIA GUIDE

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888.746.1114
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H-Shield NB

Product Description
H-Shield NB is a rigid roof insulation composite panel composed of a closed cell polyisocyanurate foam core manufactured on-line to a fiber reinforced facer on one side and either ⅛” or ⅜” oriented strand board (OSB) on the other. H-Shield NB can also be manufactured off-line bonded to ⅛” or ⅜” plywood.

Features and Benefits
- Manufactured with NexGen Chemistry: Contains no CFCs, HFCs, HCFCs, is Zero ODP, EPA Compliant, and has virtually no GWP
- A superior combination of high insulating properties and a nailable surface
- Suitable for new construction and re-roofing on both commercial and residential projects
- Incorporates APA-TECO Rated Exposure 1 OSB and Plywood
- The edges of the wood panels are rabbeted to allow for expansion and contraction of the wood. The foam edges shall be installed tightly to achieve thermal integrity across the entire roof deck
- Available as a non-rabbeted panel upon special request
- Hail Rating: SH-1, VSH

Panel Characteristics
- Available in two grades of compressive strengths per ASTM C1289 Type V, Class 1 Grade 2 (20 psi) or Grade 3 (25 psi)
- Also available in ASTM C1289 Type V, Class 2 (H-Shield CG), Grade 2 (20 psi) or Grade 3 (25 psi)
- Available foam size is 47.5”x95.5” when manufactured on line in thicknesses of 1.5” (38mm) to 4.0” (102mm)
- Available in foam size is 48”x96” when manufactured off-line in thicknesses of 1.5” (38mm) to 4.0” (102mm)
- Multiple Substrate Types Available:
  - OSB: 7/16” or 5/8”
  - Plywood: 5/8” or 3/4” CDX
  - Fire-Treated

APPLICATIONS
- Heavyweight Shingles
- Standing Seam Metal Roof Systems
- Tile
- Slate
- Single-Ply Roof Systems - Ballasted, Mechanically Attached, Fully Adhered. (For high wind speed warranty — see individual Single-Ply manufacturer approvals and listings)

H-Shield NB THERMAL VALUES

<table>
<thead>
<tr>
<th>THICKNESS† (INCHES)</th>
<th>LTTR R-VALUE*</th>
<th>FLUTE SPANABILITY (INCHES)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.5</td>
<td>38</td>
<td>6.3 4 3/8&quot;</td>
</tr>
<tr>
<td>2.0</td>
<td>51</td>
<td>9.2 4 3/8&quot;</td>
</tr>
<tr>
<td>2.5</td>
<td>64</td>
<td>12.0 4 3/8&quot;</td>
</tr>
<tr>
<td>3.0</td>
<td>76</td>
<td>15.0 4 3/8&quot;</td>
</tr>
<tr>
<td>3.5</td>
<td>89</td>
<td>18.0 4 3/8&quot;</td>
</tr>
<tr>
<td>4.0</td>
<td>102</td>
<td>21.1 4 3/8&quot;</td>
</tr>
</tbody>
</table>

*Long Term Thermal Resistance Values are based on ASTM C 1289.
†Thickness is calculated with 7/16” OSB.

H-Shield NB is only manufactured in the sizes listed above and on our packaging and weight chart. R-values other than those listed can be achieved by installing a multi layer system consisting of an additional layer of flat polyiso under H-Shield NB.

Codes and Compliances
- ASTM C 1289 Type V, 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
- 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 details

Factory Mutual Approvals
- FM 4450, FM 4470
- Approved for Class 1 insulated steel deck constructions. Refer to FM Approval’s RoofNav for details on specific systems

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
**INSTALLATION**

**Shingles, Tiles, Slate, Metal and Membrane Roofing**

H-Shield NB is installed, wood side up over steel, plywood or structural roof decks. Hunter SIP NB Panel Fasteners are required to secure the H-Shield NB to the steel or plywood deck. Wood blocking, if necessary, should be equal in thickness to the H-Shield NB and should be installed along the eaves and rake edges of the roof. The roofing system is then installed according to the manufacturer’s recommendations.

H-Shield NB may be adhered to a ½” per ft. max slope properly prepared cementitious deck (with a full mopping of Type III or Type IV asphalt or a low rise adhesive) only when manufactured online. **All H-Shield NB manufactured off-line must be mechanically attached.**

**The Use of Synthetic Underlayments**

The use of synthetic underlayments is becoming an industry norm (for steep slope applications). Hunter Panels strongly suggests the use of a synthetic underlayment under asphalt shingles unless otherwise specified by the shingle manufacturer. Synthetic underlayments provide excellent water resistance and absorb no moisture.

**Vapor Retarders**

In building construction, vapor retarders are used to inhibit or block the passage of moisture into roofing assemblies. Vapor barriers also serve as air barriers to limit the movement of moisture-laden air from the interior to the exterior. This is especially important during the construction phase where excessive moisture drive is present. To determine whether a vapor retarder is necessary, we recommend that calculations on the building’s interior relative humidity, interior temperature conditions and outside temperature fluctuations during the various seasons be performed prior to the completion of the design. Excessive moisture migration can cause unwanted condensation that will potentially damage the system or infiltrate the occupied space. Hunter Panels strongly suggests the use of a vapor retarder with a perm value of 0.5 or less on all projects except in extreme cooling conditions. Consult a licensed design professional, architect or engineer to establish whether or not a vapor retarder is necessary and to specify its type and location within the assembly. This criteria varies with geographical location and is therefore specific to each project.

**Fastening Guidelines**

Hunter Panels requires the use of the Hunter Panels SIP SD Panel Fastener for steel deck applications, the SIP WD for plywood deck applications, and SIP HD for heavy duty steel decks. Additional information on fasteners and fastening patterns are available on our website at www.hunterpanels.com.

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**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.

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**H-SHIELD NB TYPICAL PHYSICAL PROPERTY DATA CHART**

<table>
<thead>
<tr>
<th>PROPERTY</th>
<th>TEST METHOD</th>
<th>VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compressive Strength</td>
<td>ASTM D 1621</td>
<td>20 psi* (138kPa, Grade 2)</td>
</tr>
<tr>
<td>Dimensional Stability</td>
<td>ASTM D 2126</td>
<td>2% linear change (7 days)</td>
</tr>
<tr>
<td>Moisture Vapor Transmission</td>
<td>ASTM E 96</td>
<td>&lt; 1 germ (57.5ng/(Pa•s•m²))</td>
</tr>
<tr>
<td>Water Absorption</td>
<td>ASTM C 209</td>
<td>&lt; 1% volume</td>
</tr>
<tr>
<td>Flame Spread**</td>
<td>ASTM E 84</td>
<td>&lt; 75</td>
</tr>
<tr>
<td>Smoke Developed**</td>
<td>ASTM E 84</td>
<td>&lt; 450</td>
</tr>
<tr>
<td>Service Temperature</td>
<td>–</td>
<td>-100° to 250° F (-73°C to 122°C)</td>
</tr>
</tbody>
</table>

*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.
Hunter Panels Products

• H-Shield NB

Roof Types:

• Single Ply Membranes
• Standing Seam Metal

Deck Types

• Wood Framing - 16" or 32" OC
• Concrete
• Steel

Notes

• H-Shield-NB must be installed on a structural deck. Do not install directly to framing. H-Shield-NB is not a structural panel.
• Fasteners must be FM approved. Use Hunter Panels SIP WD for plywood decks.
• Fastener must penetrate the structural deck by at least 1".
• For slate and tile roofs, contact manufacturer for recommendations.
• The above fastening pattern meets FM 1-60 and 90 requirements in low slope applications where applicable.
• For UL-90 rated assemblies under select metal roof systems, please contact the Standing Seam Metal manufacturer for approved fastener, plate and fastening pattern.
Hunter Panels Products

- H-Shield NB

Roof Types

- Single Ply Membranes
- Standing Seam Metal

Deck Types

- Wood Framing - 24" OC
- Concrete

Notes

- H-Shield-NB must be installed on a structural deck. Do not install directly to framing. H-Shield-NB is not a structural panel.
- Fasteners must be FM approved. Use Hunter Panels SIP WD for plywood decks.
- Fastener must penetrate the structural deck by at least 1"
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- For UL-90 rated assemblies under select metal roof systems, please contact the Standing Seam Metal manufacturer for approved fastener, plate and fastening pattern.
H-SHIELD NB FASTENING PATTERN FOR STEEP SLOPE APPLICATIONS

GREATER THAN ½:12

Hunter Panels Products
- H-Shield NB

Roof Types:
- Shingles
- Slate
- Tile
- Standing Seam Metal

Deck Types
- Wood Framing - 16" or 32" OC
- Concrete
- Steel

Notes
- H-Shield-NB must be installed on a structural deck. Do not install directly to framing. H-Shield-NB is not a structural panel.
- Use Hunter Panels SIP WD for plywood decks.
- Fastener must penetrate the structural deck by at least 1".
- For slate and tile roofs, contact manufacturer for recommendations.
- For UL-90 rated assemblies under select metal roof systems, please contact the Standing Seam Metal manufacturer for approved fastener, plate and fastening pattern.
H-SHIELD NB FASTENING PATTERN FOR STEEP SLOPE APPLICATIONS

GREATER THAN 1⁄2:12

Hunter Panels Products
• H-Shield NB

Roof Types
• Shingles
• Slate
• Tile
• Standing Seam Metal

Deck Types
• Wood Framing - 24" OC
• Concrete

Notes
• H-Shield-NB must be installed on a structural deck. Do not install directly to framing. H-Shield-NB is not a structural panel.
• Use Hunter Panels SIP WD for plywood decks.
• Fastener must penetrate the structural deck by at least 1"
• For slate and tile roofs, contact manufacturer for recommendations.
• For UL-90 rated assemblies under select metal roof systems, please contact the Standing Seam Metal manufacturer for approved fastener, plate and fastening pattern.
**NOTES:**

Recommend a minimum of 6" stagger on all sides of the base layer and subsequent layers of polyiso being installed in a multi-layer system.
The Hunter Panels SIP WD Fastener is intended to mechanically attach Cool-Vent and H-Shield NB to plywood substrates. The Hunter Panels SIP WD Fastener has the following features:

- FM approved—plates not required
- Pull-out values for plywood
- Star/spider head eliminates need for washer and offers dramatically increased pull-out value
- Multiple bits included in each pail
- 100% American made
- Fast, one-step installation
- No pre-drilling

Fasteners should never be struck with a hammer during installation.

### Test Description

<table>
<thead>
<tr>
<th>Test Description</th>
<th>Typical Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pull-through (lbs)</td>
<td>630</td>
</tr>
<tr>
<td>Pull-out (lbs):</td>
<td></td>
</tr>
<tr>
<td>1/2&quot; plywood</td>
<td>442</td>
</tr>
<tr>
<td>5/8&quot; plywood</td>
<td>459</td>
</tr>
<tr>
<td>3/4&quot; plywood</td>
<td>710</td>
</tr>
<tr>
<td>Douglas Fir (1&quot; pen.)</td>
<td>768</td>
</tr>
</tbody>
</table>

### Physical Data Chart

<table>
<thead>
<tr>
<th>Physical Data Chart</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Head Diameter</td>
<td>.625&quot;</td>
</tr>
<tr>
<td>Thread Diameter</td>
<td>.240&quot;</td>
</tr>
<tr>
<td>Shank Diameter</td>
<td>.190&quot;</td>
</tr>
</tbody>
</table>

Minimum 1" penetration into plywood deck.
Fastener Info - SIP SD - Steel Deck Fastener and Structural Concrete

The Hunter Panels SIP SD Fastener is intended to mechanically attach Cool-Vent and H-Shield NB to 18–22 gauge corrugated steel decking and structural concrete. The Hunter Panels SIP SD Fastener has the following features:

- FM approved—plates not required
- Pull-out values for steel
- Star/spider head eliminates need for washer and offers dramatically increased pull-out value
- Multiple bits included in each pail
- 100% American made
- Fast, one-step installation
- No pre-drilling when used on a steel deck
- For use on structural concrete, 3/16" pilot hole 1 1/2" deep is required

### Test Description

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<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>Pull-through (lbs)</td>
<td>630</td>
</tr>
<tr>
<td>Pull-out (lbs):</td>
<td></td>
</tr>
<tr>
<td>22 gauge metal</td>
<td>510</td>
</tr>
<tr>
<td>18 gauge metal</td>
<td>920</td>
</tr>
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</table>

Fasteners should never be struck with a hammer during installation.

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<table>
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</thead>
<tbody>
<tr>
<td>Head Diameter</td>
<td>.625&quot;</td>
</tr>
<tr>
<td>Thread Diameter</td>
<td>.240&quot;</td>
</tr>
<tr>
<td>Shank Diameter</td>
<td>.190&quot;</td>
</tr>
<tr>
<td>Fastener Length</td>
<td>3.5&quot;, 4&quot;, 4.5&quot;, 5&quot;, 5.5&quot;, 6&quot;, 6.5&quot;, 7&quot;, 7.5&quot;, 8&quot;, 9&quot;, 10&quot;, 11&quot;, 12&quot;, 13&quot;</td>
</tr>
</tbody>
</table>

Minimum 1" penetration into top flute of steel deck.

For more information on this product, visit www.hunterpanels.com.
Hunter Panels SIP HD Fastener is intended to mechanically attach Cool-Vent or Hunter NB to 16 gauge or greater corrugated steel decking. Hunter Panels SIP HD Fastener has the following features:

- FM approved—plates not required
- Pull-out values for steel
- Star/spider head eliminates need for washer and offers dramatically increased pull-out value
- Multiple bits included in each pail
- 100% American made
- Fast, one-step installation
- SIP/HD is for 16 gauge or thicker steel deck
- No pre-drilling

**Test Description**

<table>
<thead>
<tr>
<th>Test Description</th>
<th>Typical Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pull-through (lbs)</td>
<td>630</td>
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<tr>
<td>Pull-out (lbs):</td>
<td></td>
</tr>
<tr>
<td>Structural Steel 16 ga</td>
<td>770</td>
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Fasteners should never be struck with a hammer during installation.

**Physical Data Chart**

<table>
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<th>Physical Data Chart</th>
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<tbody>
<tr>
<td>Head Diameter</td>
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<tr>
<td>Thread Length</td>
<td>3.875&quot;</td>
</tr>
<tr>
<td>Shank Diameter</td>
<td>.212&quot;</td>
</tr>
<tr>
<td>Fastener Length</td>
<td>4.5&quot;, 6.0&quot;, 8.0&quot;</td>
</tr>
</tbody>
</table>
NOTES
RABBETED EDGE DEFINITION:
The wood substrate on H-Shield NB is rabbeted (routed) back on all four sides to allow for expansion of the wood substrate.
**Notes**

1. Stagger rows by following H-Shield NB layout above. When H-Shield NB is cut into two equal halves, no waste occurs.
**NOTES**

**EAVE EDGE:**

1. Pressure treated blocking to the panel thickness of H-Shield NB shall be installed along the eave & rake edges.
1. For valleys and hips, cut a piece of H-Shield NB in half, snap a chalk line from SE to NW corner and cut end to end.
HIP AND VALLEY DETAIL

NOTES
Notes

1. Fasten H-Shield NB panels into top flutes of steel deck
**NOTES**
**Notes**

- **Polyiso Foam**
- **Structural Substrate**
- **Standing Seam Roofing**
- **Metal Flashing**
- **Recommended Fastener (See Manufacturers Specification)**
- **Synthetic Underlayment (Refer to Local Building Codes)**
- **Vapor Barrier (If Applicable)**
- **2" X 10" Blocking**
1. CONSTRUCTION GENERATED MOISTURE

Buildings under construction are susceptible to water and or moisture intrusion from the unfinished portions of the roof or adjacent components of the building. Some of the most common sources of moisture drive are:

- Pouring of a concrete floor or other masonry work in an enclosed building
- The use of heaters or “salamanders” to provide more comfortable conditions or help cure the freshly poured concrete.
- The use of oil burning heaters
- The use of paint, plaster and other water based construction materials

Effects of moisture generated during construction on the roofing system can cause the following conditions:

- Water accumulation in the steel deck flutes causing corrosion and possible intrusion into the building
- Condensed moisture can promote microorganism growth
- Moisture drawn into the roof system may have a deleterious effect on the physical properties of the roof insulation (i.e. dimensional stability, thermal properties)

Adherence to good construction practices can minimize some or all of the above-mentioned conditions. Adequate ventilation should be provided at all times for enclosed construction to limit moisture drive through the underside of the roof deck. The use of multi-layered roof insulation assemblies will enhance thermal performance as well as restrict the transport of moisture into the roof system. During roof construction, the completed roof section should be tied off each day to protect the new roof from water entry.

2. VAPOR DIFFUSION RETARDERS

In building construction, vapor retarders are used to inhibit or block the passage of moisture into roofing assemblies. Vapor barriers also serve as air barriers to limit the movement of moisture-laden air from the interior to the exterior. This is especially important during the construction phase where excessive moisture drive is present. To determine whether a vapor retarder is necessary, we recommend that calculations on the building’s interior relative humidity, interior temperature conditions and outside temperature fluctuations during the various seasons be performed prior to the completion of the design. Excessive moisture migration can cause unwanted condensation that will potentially damage the system or infiltrate the occupied space.

Hunter Panels strongly suggests the use of a vapor retarder with a perm value of 0.5 or less on all projects except in extreme cooling conditions. Consult a licensed design professional, architect or engineer to establish whether or not a vapor retarder is necessary and to specify its type and location within the assembly. This criteria varies with geographical location and is therefore specific to each project.
3. **MULTI-LAYERED ROOF INSULATION**
Multi-layering of polyiso in any roof application installed with staggered joints offers a number of advantages and is considered good roofing practice because doing so:

- Minimizes thermal loss at the joints of the insulation, prevents thermal bridging
- Prevents moisture from inside of the structure from condensing on the underside of the finished roof system

4. **FASTENER REQUIREMENTS**
To ensure optimal performance, Hunter Panels requires the use of the Hunter SIP SD or Hunter SIP HD for steel deck applications, and the Hunter SIP WD for plywood deck applications.

5. **USE OF SYNTHETIC UNDERLAYMENTS**
The use of synthetic underlayments is becoming the industry norm for steep slope roofing assemblies. Hunter Panels strongly suggests the use of a synthetic underlayment under asphalt shingles unless the shingle manufacturer has specifically eliminated it. Synthetic underlayments offer several key advantages over traditional asphalt felt:

- Larger rolls with fewer laps and less nailing
- Lighter weight for easier handling and quicker installation
- May be left exposed for longer periods of time without organic deterioration
- Synthetic reinforced polypropylene wicks the moisture and provides excellent water resistance
- Some manufacturers of synthetic underlayment offer products with prolonged exposure to UV rays, greater fire resistance, tear strength and puncture resistance

Hunter Panels does not recommend the use of 15# and 30# roofing felt as an underlayment to asphalt shingles on our H-Shield NB product. Use of these felt products will void any and all claims regarding a H-Shield NB assembly. Hunter Panels cannot be responsible for claims arising out of aesthetic anomalies caused by roofing felts in the assembly.

6. **SHINGLE CONSIDERATION**
The roof covering is one of the most important considerations of any low slope or steep slope application. In most steep slope roofing projects, however, the visual appeal or aesthetic look plays almost as large a role as the true performance and physical properties of the shingle. Please confirm that your shingle manufacturer does not require a ventilated roof system. If a vented system is required, Cool-Vent panels can be substituted.

Please go to www.hunterpanels.com for the latest product literature, specifications and other documents relating to this product.
WARNINGS AND LIMITATIONS

This material must be kept dry, stored above ground/roof level on pallets and completely covered (top & sides) with a waterproof tarpaulin. Prolonged exposure to moisture will degrade the wood substrate and have a deleterious effect on its performance. Hunter Panels will not be responsible for the performance of this product if it is installed wet. Only install as much product in a day that can be covered with the completed roofing system.

WARRANTY

Hunter Panels will not be responsible for leakage, damage or failure of any kind caused by improper application or design, structural movement, accident or natural hazard, defective membrane or improper maintenance.

Hunter Panels warrants that its polyisocyanurate foam will conform to its published physical properties, federal specifications and ASTM standards. Hunter Panels does not warrant the performance or physical properties of the wood substrate incorporated into the H-Shield NB assembly.

Hunter Panels will not be liable for incidental or consequential damages to the structure, its contents or occupancy.

Hunter Panels makes no warranties or guarantees of any kind expressed or implied, including but not limited to implied warranties of merchantability and fitness for a particular purpose except as stated herein.