

Niagara Concrete

Polymeric Concrete Tile Roof System

This installation guide is written and provided for the use of professional roofing applicators and EcoStar™ Gold Star Authorized Applicators. Contact the technical department for information on warranty availability and the requirements and benefits of the Gold Star program.

SPECIAL NOTE: Niagara Concrete is manufactured in two different formulas. Empire Niagara Concrete has been tested and listed by Underwriters Laboratories as a Class A and as a Class C roofing material (UL 790). Majestic Niagara Concrete has been tested and listed by Underwriters Laboratories as a Class C roofing material (UL 790). Niagara Concrete has been tested and listed by Underwriters Laboratories as a Class 4 impact resistance product (UL 2218). To maintain the requirements of these tests and their listings the roof system must be installed exactly as stated in this installation guide.

WARRANTIES*

EcoStar warrants this product to be free of manufactured defects at the time of shipment from EcoStar's factory. EcoStar will at its option either supply new product or pay the reasonable cost of replacement products found to be defective hereunder.

EcoStar's limited warranties are the only warranties extended by EcoStar with respect to its materials. There are no other warranties, including the implied warranties of merchantability and fitness for a particular purpose. EcoStar specifically disclaims liability for any incidental, consequential, or other damages, including but not limited to, loss of profits or damages to a structure or its contents, arising under any theory of law whatsoever.

The dollar value of EcoStar's liability and buyer's remedy under this limited warranty shall not exceed the purchase price of the EcoStar material in question.

SHADE VARIATION

All Niagara Concrete tiles come with shade variation. EcoStar tiles that have been ordered and supplied to the job site under one **EcoStar sales order number are blended at the factory and do not need to be blended onsite before installation. It is always the responsibility of the applicator to make frequent inspections from the ground or other vantage point to ensure that random shading occurs.** EcoStar will not be held responsible for correcting the appearance of non-random installations. Roofers must inspect the roof frequently to prevent customer dissatisfaction.

NOTE: If EcoStar tiles have been supplied to the job site under two or more EcoStar sales order numbers, all tiles must be blended together on-site before installation. Specific blending instructions can be found at www.ecostarllc.com on the "Resource Library" page. EcoStar will not be held responsible for correcting the appearance of unblended installations.

Natural weathering will produce further shade variations, even in tiles appearing to be identical in color when new.

TEMPERATURE

Like all roofing materials, EcoStar tiles are subject to thermal contraction and expansion. To ensure that they are installed at their normal dimensions, materials should be installed at temps of 45°F (7°C) or greater. EcoStar considers any installation when ambient temperatures are below 45°F (7°C) to be a "low temperature installation". If tiles have been stored in temperatures below 45°F (7°C), they must be restored to a temperature above 45°F (7°C) before installation. Ambient temperature should be at least 34°F (1°C) and rising. For assistance with low temperature installations, please contact the technical department.

SUBSTRATE

The tiles should only be installed on a minimum of 15/32" (12 mm) plywood decking, 7/16" (11 mm) OSB or minimum 3/4" (19 mm) tongue and groove decking with end gaps not exceeding 1/4" (6 mm). Contact the technical department for approved alternatives. Under all circumstances, existing roof materials must be removed down to the deck, prior to installation.

SLOPE

The tiles are not recommended for slopes less than 3/12 (14°). If this is desired, contact the technical department for review. On roof slopes less than 6/12 (27°), the tiles must be installed with a maximum 9" (229 mm) exposure. On roof slopes of 6/12 (27°) or greater, the tiles may be installed with a 9" (229 mm) or 10" (254 mm) exposure.

UNDERLAYMENT

Glacier Guard™ or equal must be applied to all eaves, rake edges, hips, valleys, ridges and protrusions. If a Class C roof system has been specified, cover the remaining exposed deck with **Aqua Guard™** or equal. If a Class A roof has been specified, **GP Gypsum Corporation DensDeck®** roof board may be used, or **GAF VersaShield®** underlayment, or EcoStar-approved alternate. If **VersaShield** or EcoStar-approved alternate is used, it must be applied over the entire roof deck, after the installation of the **Glacier Guard. Gold Star Warranty*** requires the use of the above mentioned EcoStar specified products.

FASTENERS

Stainless Steel Ring Shank roofing nails are recommended for application of the tiles. **Gold Star Warranty*** application requires the use of **EcoStar Ring Shank Fasteners**. Hand drive and pneumatic coil nails are available.

FLASHING MATERIAL

EcoStar recommends that flashing be either copper or stainless steel. Flashing metal, however, is not covered by any EcoStar warranty. Like materials should be used when fastening metal flashings.

SEALANTS

If local codes require the use of a shingle sealant, the only material approved for use with EcoStar tiles is Dow Corning 790 silicone sealant.

* See www.ecostarllc.com for available warranties.



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INSTALLATION STEPS

Niagara Concrete tiles are designed and manufactured to duplicate the look of a flat concrete roof tile.

1. Install **Glacier Guard** in all valleys, eaves, rake edges, hips, ridges and protrusions. **Gold Star Warranty*** application requires the use of **Glacier Guard**.

2. Install a minimum of 30 lb (13.6 kg) (ASTM D226 Type II or ASTM D4869 Type IV) felt over the remaining area of the deck surface. If a Class C roof is required, the 30 lb (13.6 kg) felt or equal must be UL listed. **Gold Star Warranty*** application requires the use of **EcoStar Aqua Guard** underlayment for a Class C roof system. If a Class A roof is required, install **GAF VersaShield®** or EcoStar-approved alternate over the entire deck including areas already covered by the **Glacier Guard**. **Gold Star Warranty*** application requires the use of **GAF VersaShield®** or EcoStar-approved alternate for a Class A roof system.

3. Install metal edging at eaves and rake edges. Any corrosion resistant metal edging is acceptable. Copper and stainless steel are recommended. It should be noted that EcoStar Warranties do NOT cover metal flashing.

Note: When using copper and stainless steel flashing material the appropriate corresponding nails should be used.

4. Beginning at the eave edge, install a starter row of tiles with two nails per tile (in location shown on tiles). 1 3/4" (44 mm) long stainless steel ring shank roofing nails are recommended. **Gold Star Warranty*** application requires the use of **1 3/4" (44 mm) EcoStar Ring Shank Fasteners**. Maintain a minimum 3/8" (10 mm) gap between starter tiles.

5. When using pneumatic nailing equipment, frequently check the depth and pressure setting, so nails are not over driven, causing tiles to lift. Lifted tiles will diminish the aesthetic appearance of the finished roof system. The nail should not dent the tile.

6. The initial layer of tiles becomes the starter row. This layer will be completely covered by the next row to be installed. If Niagara Concrete tiles are used for the starter row, cut 8" (203 mm) off the top of each tile before installation. When the first course of tiles is installed, tiles must be offset half a tile to cover the nails from the previous row. A minimum of a 3/8" (10 mm) gap is required between tiles and between tiles and protrusions. If a thinner profile is desired at the eaves, Empire or Majestic Traditional 12" (305 mm) tiles may be used for the starter row. Make sure there is at least a 4" (102 mm) offset between the starter row tile gaps and the first exposed row tile gaps. You will have to cut the starter row tiles to fit to achieve the proper gap offset. When using Empire or Majestic Niagara Concrete for starter, the tiles may be installed either front side up or back side up.

7. As the tiles are installed up the roof, the tiles must be cut at rake edges, valleys and protrusions. The tiles can be cut using a straight edge and a utility or roofing knife, but it may be quicker and easier to use a power saw. Any blade designed to cut wood will cut the tiles. Cut the tiles so that the cut will be toward the field of the roof away from the rake edge

8. As the tiles are installed up the roof slope, it is recommended that lines be snapped both horizontally and vertically. The horizontal lines will keep the tiles looking straight and uniform. The vertical lines will keep the space between the tiles in line from row to row. **DO NOT USE RED CHALK. Red chalk will stain the tiles.**

9. **CAUTION:** As the tiles are installed up the slope of the roof, the installation should be constantly checked from the ground to ensure there is no patterning developing and proper blending is occurring. The warranty does NOT cover the aesthetic appearance of the Niagara Concrete roof installation. It is the responsibility of the applicator to ensure that color/shading and quality of workmanship meets the aesthetic expectations of the home/building owner.

10. Continue to install the tiles up the roof slope. Be sure to place the nails directly in the position noted on the tiles. Stainless steel ring shank nails are recommended.

Tiles can be slippery when wet, caution should be exhibited with early morning dew, frost and after rain. EcoStar suggests the use of toe boards, OSHA approved harnesses and safety equipment at all times.

11. When all tiles have been applied to the roof slopes, the pre-formed Niagara Concrete Hip & Ridge tiles are applied to all hips and ridges. **Niagara Concrete Hip & Ridge tiles can be installed with a 7" (178 mm), 8" (203 mm) or 9" (229 mm) exposure with two 2 1/2" (64 mm) nails per tile.** The use of ridge venting systems is highly recommended. Mushroom cap style vents may be used, but ridge venting provides better venting and improves the aesthetic appearance of the roof system. Ridge venting must be installed before installing the Hip & Ridge. When installing over ridge vent, Hip & Ridge tiles are installed with 2 1/2" (64 mm) nails. The Niagara Concrete Hip & Ridge tiles can also be used for the Rake Edge, if desired for aesthetic appearance, but are not required for Installation purposes.

12. As work progresses up roof slopes care should be taken to minimize traffic over completed areas of the roof. The tiles will show any mud or dirt tracked across them. This will cause aesthetic issues with the completed appearance of the roof. It is the responsibility of applicator or building owner to remove this mud or dirt. A mild detergent should be used in combination with a bucket of water to remove the mud or dirt. Clean water can then be used to finish the cleaning process. Do not use any chemicals or solvents without first checking with the EcoStar technical department. **EcoStar is not responsible for the cleaning of any tiles.**

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PRODUCT IDENTIFICATION

This area provides identification of the product and a toll free contact telephone number for questions or assistance with the product and installation.

IMPORTANT INFORMATION

This area of the tile provides pertinent information about installation and the need to use a trained applicator to install the product.

QUALITY INFORMATION

on back

This area of the tile is used by the production department to denote the date the part was manufactured. This allows tracking of quality by production time. This information is on the back of the tile.

INSTALLATION MEASUREMENT

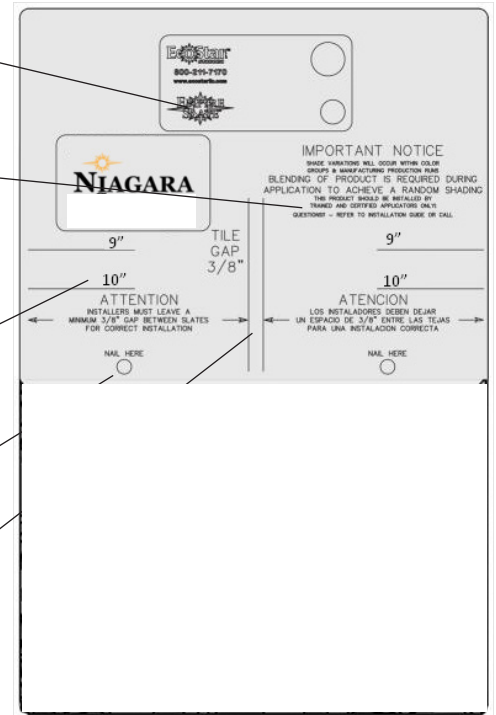
Two marks are molded into every tile. When these marks are placed in alignment with the top edge of the previous row of tiles, proper tile exposure is provided automatically.

TILE FASTENING

Molded into each tile is a fastener locator. This assists during installation for proper positioning of the fastener.

GAP

During installation the tiles must be placed a minimum of $\frac{3}{8}$ " (10 mm) apart. Tiles must never be installed directly adjacent to each other. This area of the tile states this in both English and Spanish.



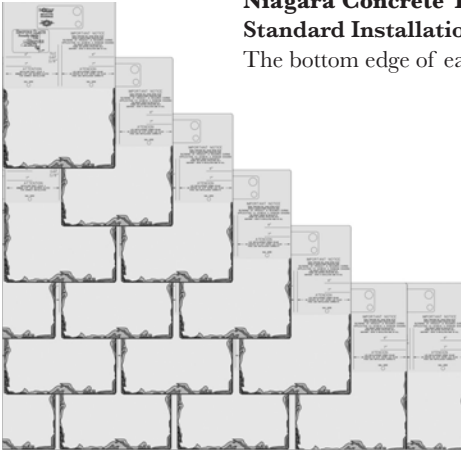
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12" wide x 22" long
(305 mm x 559 mm)

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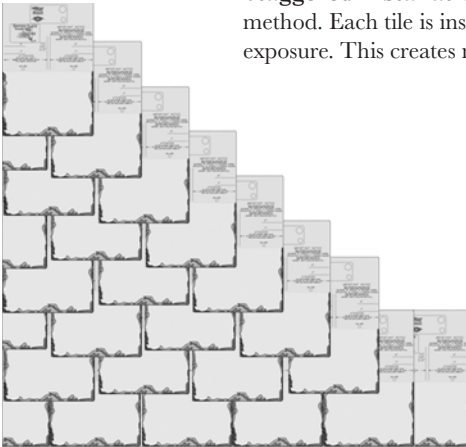
Niagara Concrete Traditional Design

Standard Installation: This drawing depicts the traditional tile installed in the standard method. The bottom edge of each tile is in line with the next and the vertical spacing between the tiles is in line.



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Staggered Installation: This drawing depicts the traditional tile installed using the staggered method. Each tile is installed alternating between the 9" (229 mm) exposure and the 10" (254 mm) exposure. This creates more texture in the roof system.



NOTE: Layouts depicts slate tiles but applies to concrete tiles.



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