

Tough-Glass® GENERAL INSTRUCTIONS

IMPORTANT: THE STATEMENTS EXPRESSED ON THIS WRAPPER ARE THE RECOMMENDATIONS FOR THE APPLICATION OF THE ROOFING PRODUCTS AS OUTLINED AND ILLUSTRATED. ANY DEVIATION FROM THESE RECOMMENDED PROCEDURES SHALL BE AT THE SOLE RISK OF THE INSTALLERS. FAILURE TO FOLLOW THESE INSTRUCTIONS MAY RESULT IN SERIOUS DAMAGE TO THE APPLICATION AND LIFE OF THIS ROOFING PRODUCT, RESULTING IN THE TERMINATION OF ANY WARRANTY, EXPRESS OR IMPLIED.

1. GENERAL INSTRUCTIONS

These Tough-Glass® shingles are warranted against manufacturing defects and wind gusts up to 60 MPH. The Tough-Glass® Limited Warranty can be obtained by visiting www.AtlasRoofing.com/Warranty, or by writing to: Atlas Roofing Corporation, Attn: Consumer Service Department, 802 Hwy 19 N., Suite 170, Meridian, Mississippi, 39307. The following instructions must be followed to qualify for protection under the Tough-Glass® Limited Warranty.

Important: See special instructions below for Low Slope Applications. See special instructions below for Steep Slope/Mansard/ High Wind application. To obtain stated area coverage and to achieve design performance and appearance, the directions on this package must be followed. Sealing of the adhesive strips on each shingle to the shingle beneath is created by heat from sunlight. Atlas Roofing Corporation also endorses the Asphalt Roofing Manufacturers Association's (ARMA) recommendations for application details not specified within this text.

Important: Do not apply Tough-Glass® shingles on roofs having a slope less than 2" per ft. See special instructions for Low Slopes (2" to 4" per ft.) and for Steep Slope/Mansard/High Wind application. To obtain stated area coverage and to achieve design performance and appearance, the directions on this package must be followed. Sealing of the adhesive strips on each shingle to the shingle beneath is created by heat from sunlight. Sealing may be delayed if shingles are applied during cooler temperatures, or to roof areas that do not receive direct sunlight. Dust accumulation may also further delay sealing. If any of the strips have not activated properly after a reasonable time period, hand sealing may be necessary. Shingles in prolonged storage may pick up temporary staining, which is removed by natural weathering. Double stacking can cause staining and sticking in the bundle. Atlas Roofing Corporation also endorses the Asphalt Roofing Manufacturers Association's (ARMA) recommendations for application details not specified on this wrapper.

2. ROOF DECK VENTILATION

Adequate ventilation under the roof deck must be provided to prevent harmful condensation in winter and heat build-up in summer. These conditions can cause: A. Accelerated shingle weathering B. Deck rot and attic fungus C. Shingle distortion/cracking due to deck movement D. Cosmetic blisters on the shingle surface. Atlas will not be responsible for damage to shingles as a result of inadequate ventilation. Ventilation provisions must meet or exceed current FHA Minimum Property Standards and conform to all building codes and regulations. To best ensure adequate ventilation and circulation of air, a combination of vents at ridge and eaves should be used. All roof structures, especially mansard and cathedral type ceilings, must have complete through ventilation from the eaves area to the ridge area. FHA Minimum Property Standards require one sq. ft. of net free ventilation area for each 150 sq. ft. of attic floor space to be vented; or one sq. ft. per 300 sq. ft., if vapor barrier is installed on the warm side of ceiling, or if at least one half the ventilation area is provided near the ridge.

3. ROOF DECK

These instructions are for the application of Atlas asphalt shingles to nominal 7/16" thick American Plywood Association (APA/TECO) rated, code approved plywood, OSB decks or minimum 3 /4" actual thickness wood decks. The plywood or non-veneer (OSB) decks must comply with the roof deck specifications of APA/TECO. Solid wood decking must be well seasoned, not over 6" (nominal) width, and fastened securely to each rafter. The deck surface must be clean, bare, gap free and flat. Tough-Glass® shingles must not be applied to any surface other than roof deck types described here. Atlas also honors its Shingle Limited Warranty when Atlas

shingles are installed on the Atlas CrossVent® Nailable Insulation panels. Atlas will not be responsible for the performance of its shingles if applied directly to non-vented, insulated decks composed of perlite board, plastic foam, fiberboard, gypsum plank, lightweight concrete, cementitious wood fiber, or similar materials or to any decks with insulation installed directly to the underside of the decking, with the exception of CrossVent® Nailable Insulation. Spray foam insulation applied directly to the bottom of the decking will void the warranty. Atlas shingles may be installed over a roof system containing a radiant barrier material if: 1. the required full, flow through ventilation is maintained directly under the decking material in all cases, 2. the radiant barrier material is highly vapor permeable (> 2 perms), and, 3. the radiant barrier is installed on the underside of or below the decking – not used as an underlayment above the decking. Spray-on types of below deck vapor permeable radiant barriers will be considered only on a job by job basis, and only if tests confirm > 2 perms or greater vapor permeability.

4. UNDERLAYMENT

Atlas highly recommends the use of high performance, ASTM 6757 compliant - Gorilla Guard® or Summit® proprietary underlayment products for long term roof system performance and WeatherMaster® Granular, self-adhering, waterproofing underlayment for critical areas, such as valleys and eaves. Atlas does not approve the use of any self-described, metalized or metal containing category of “Radiant Barrier”, as an asphalt shingle underlayment installed above the deck. Use of these types of radiant barrier would void the shingle warranty. Underlayment must be applied flat and unwrinkled. Building codes vary with geographic areas, and the installation must comply with local building codes or shingle manufacturer’s requirements, whichever is stricter. Shingles should be applied as soon as possible after the application of organic underlayment felt, which is not intended for prolonged exposure. Atlas recommends that the shingles be applied the same day as the felt underlayment application to avoid wetting and wrinkling. If an underlayment is used for prolonged dry-in, Atlas recommends Summit® Synthetic Underlayment as the dry-in underlayment, for up to 6 months exposure.

Standard Slope Application: Proper application requires that a single layer of approved underlayment be applied to decks with slopes 4:12 ($> 18.4^\circ$) up to 21:12 ($< 60^\circ$) consistent with all applicable building codes. This approved underlayment is a required roof assembly component to maintain a Class A fire rating of the deck assembly. Install underlayment over the entire deck, parallel to the eaves, overhanging 1/4” to 3/8”, with fasteners placed 2” from the deck edge, 12” O.C. across the lower edge and with 2” overlap parallel to eaves and with 4” min. end lap, parallel to the rake. Underlayment end laps shall be staggered 6 feet apart from the adjacent courses. Corrosion-resistant drip edge should be placed over the underlayment at the rake and beneath the underlayment at the eaves.

Low Slope Application: 2:12 ($> 9.5^\circ$) up to 4:12 ($< 18.4^\circ$) (51mm/305mm) on slopes of 2” to 4” rise per foot, a double layer of approved underlayment over the entire deck surface is required. Starting with a 19” wide strip at eaves and overhanging the eaves 1/4” to 3/8”, cover the first 19” course with a full 36” wide strip. Expose the first course 17” and continue up the deck with 36” wide strips, lapping each course 19” over the preceding course - providing a 17” exposure. End laps for low slopes shall be of at least 12” overlap and staggered 6 feet apart. Install drip edge over the underlayment at the rake and beneath the underlayment at the eaves. WeatherMaster® 100, 200 or 216 is highly recommended as the underlayment for Low Slope (2:12-4:12) to cover the entire deck prior to installing shingles.

5. FLASHING

All flashing should be in place before shingles are installed. Cap flashings of sheet metal and base flashings of metal or mineral surfaced roll roofing should be used at vertical surfaces such as chimneys, skylights, vents, walls, etc. All flashings should be sealed with asphalt plastic cement. Consult the Residential Asphalt Roofing Manual published by the Asphalt Roofing Manufacturers Association (ARMA) for details concerning specific methods and types of flashing installation.

6. ICE DAM PROTECTION

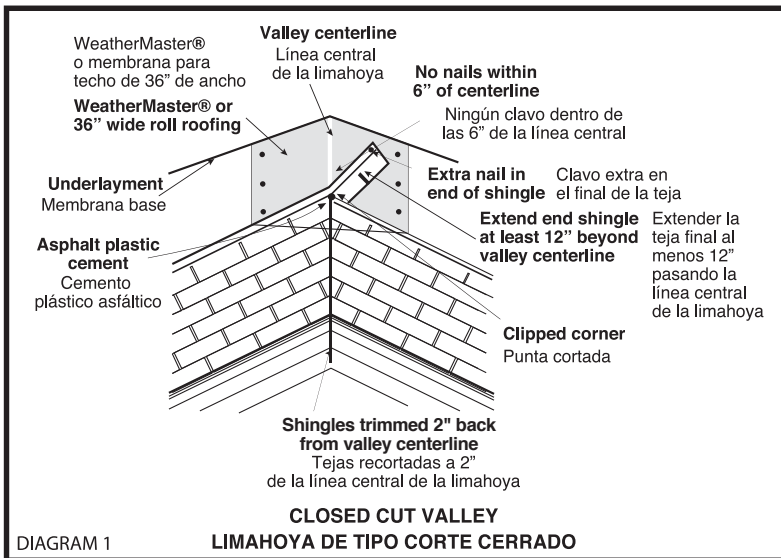
Eave and rake edge waterproof flashings must be installed per local building codes and where there is a possibility of icing along the eaves and rake edges causing a potential for ice damming and a backup of water. Atlas' WeatherMaster® Granular Underlayment, or equivalent _____

must be applied directly over the decking according to application instructions provided with the product, and local building codes. The waterproof flashing material must extend up the roof at least 24" beyond the interior warm wall line, and in areas of severe icing, at least up to the highest water level expected to occur from ice dams. If the overhang requires flashing wider than 36", the horizontal lap must be located on the overhang area and cemented or sealed. End laps must be 12" (minimum) and cemented/sealed. WeatherMaster® Granular Underlayment, as supplied by Atlas, is recommended as the first layer of Ice Dam Protection. WeatherMaster® Granular Underlayment conforms to ASTM D-1970.

7. VALLEYS

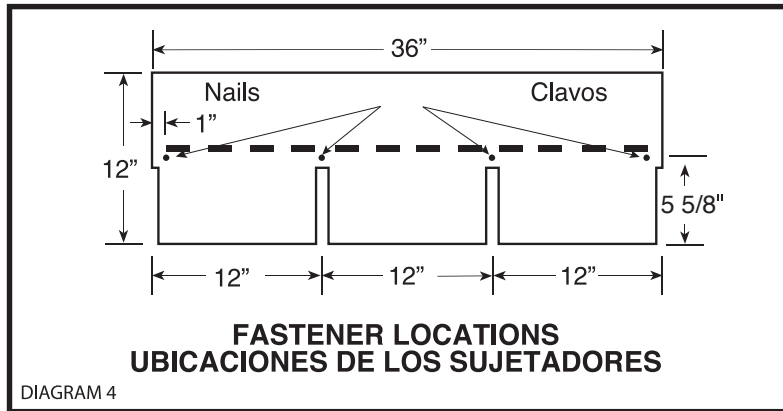
Valleys must be installed before Tough-Glass® shingles are applied.

Closed Cut Valley: Over felt underlayment or WeatherMaster® Granular, apply a 36" wide mineral surface asphalt roll roofing (with granule side up) or smooth surface asphalt roll roofing centered in the valley, nailing 2" from outer edges only. Apply all shingles on one side of valley and extending across center of valley, a minimum of 12". Nail a minimum of 6" away from the center line of the valley on the unshingled side and strike a chalk line 2" from the center line on the un-shingled side. Apply shingles on the unshingled side up to the chalk line and trim. Do not cut the underlying shingle. Cut upper corners of the shingle, cement and nail. See Diagram #1.



8. FASTENING

Placement of fasteners is critical to overall performance. New Roofing Application (first shingle layer): 4 nails are required per shingle to maintain wind performance. The nails are to be located $5/8$ " above the cutouts ($5\ 5/8$ " above the bottom edge of the shingle) and 1" in from each side of the shingles as illustrated in Diagram #4.



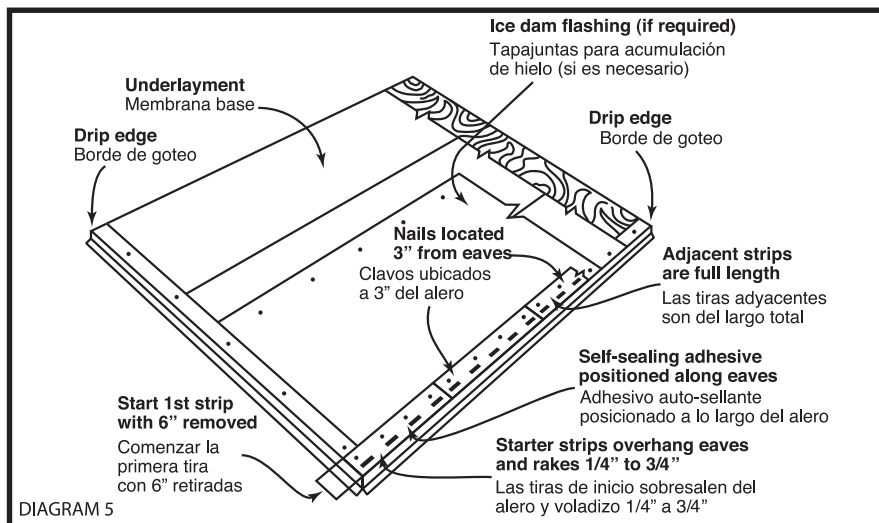
All nails must be driven straight, with the heads flush to the shingle surface, never cutting into the shingle. Nails must not be exposed (visible) on the finished roof. Nails must be 11 or 12 gauge; corrosion-resistant roofing nails with $3/8$ " minimum heads and must be a minimum of 1- $1/4$ " long. Atlas recommends 2" nails for a roof over. However, if coils with 2" nails are not available in your area, Atlas will accept the recommendation from the Asphalt Roofing Manufacturers Association (ARMA) that the nails should be long enough to penetrate $3/4$ " into the roof deck. Where the roof deck is less than $3/4$ " thick, the nails should be long enough to penetrate fully and extend at least $1/8$ " through the roof deck. Nails may be placed in the sealant line.

Re-Roofing Application (second shingle layer): Requires the same nail placement as New Roofing but NAILS MUST BE A MINIMUM OF 1- $1/2$ " LONG. NAIL PLACEMENT IS IMPORTANT FOR WIND RESISTANCE. INCORRECTLY PLACED NAILS MAY VOID WIND COVERAGE OF WARRANTY.

9. APPLICATION

Prepare deck with saturated felt underlayment, drip edges and flashings as recommended. Horizontal and vertical chalk lines should be utilized to ensure proper shingle alignment from eave to ridge.

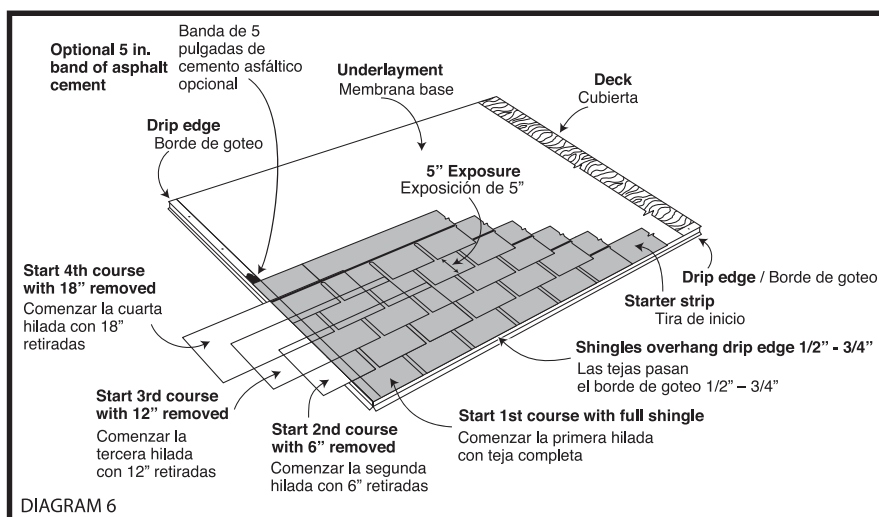
Starter Course: Use PRO-CUT® STARTER STRIP or you may use Tough-Glass® 3-tab shingle for the starter course. Trim off tabs and apply with $1/4$ " to $3/4$ " overhang on the eaves. Note the seal-down feature should be in line, and adjacent to, the eave. In order to offset seams, cut 6" off the left end of the first starter shingle. Begin application at lower left rake of roof, and then continue across with full-length shingle, nailed with 4 nails equally spaced across the shingle and nailed 3" up from the eave. See Diagram #5.



First Course: Begin first full shingle at lower left rake of roof or right of vertical chalk line and continue course across roof with full shingles laid flush with starter course and fastened with 4 nails placed as specified. **Note:** An optional band of asphalt plastic cement meeting ASTM D-4586 may be applied to the rake of the roof with each shingle course to enhance wind resistance and to resist wind driven rain. See Diagram #6.

Second Course: Cut 6" off the left end of a shingle and apply the remaining larger piece over the first course shingle, flush with the left edge and exposing the first course 5". Proceed with full shingle across roof maintaining 5" exposure. See Diagram #6.

Third Course: Cut 12" off the left end of a shingle and apply the remaining larger piece flush with the left rake edge, over the second course and exposing 5". Proceed across the roof maintaining the 5" exposure. See Diagram #6.

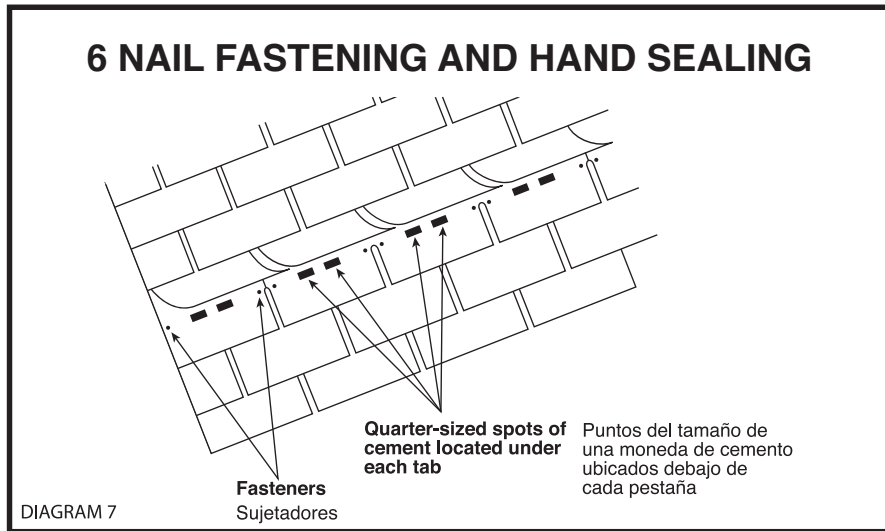


Fourth Course: Cut 18" off a shingle and apply the right half over the third course, flush with the left rake edge, exposing 5". Proceed with full shingles across the roof, maintaining 5" exposure on the course below.

Fifth Course: Repeat the above sequence to complete the roof.

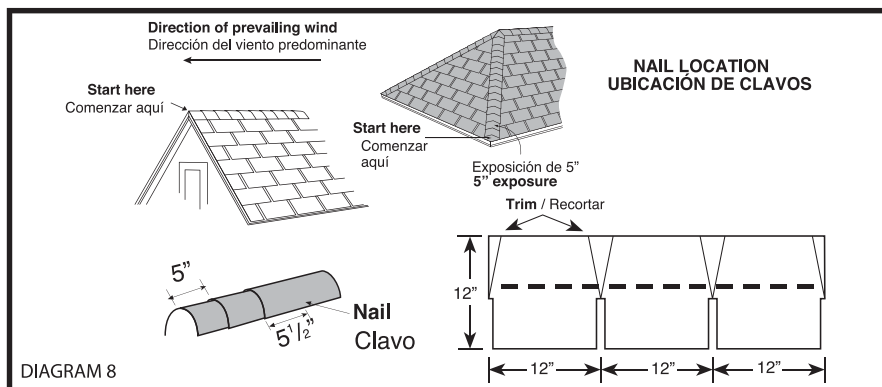
10. STEEP SLOPE/MANSARD/HIGH WIND APPLICATION

For Steep Slope/Mansard/High Wind application, 6 fasteners must be used with fasteners located 5-5/8" above shingles butt edge, 1" from each side and 1" to either side of the cutouts. Immediately upon application to slopes exceeding 60° (or 21:12), apply six (6) quarter size spots of asphalt plastic cement under each shingle as shown below. Two spots of cement about the size of a quarter are to be placed under each tab. One spot is to be placed 1" to 2" from each side edge of tab and near bottom and press into position. Cement should come near edge of shingle, but not be exposed. CAUTION: Excessive use of roofing cement can cause shingles to blister. See Diagram #7.



11. HIP AND RIDGE

To prevent cracking in cold climates when applying to hips and ridges, shingles must be sufficiently warm and flexible. Apply Atlas Pro-Cut® Hip & Ridge shingles with a 5 5/8" exposure, beginning at the bottom of the hip or from the end of the ridge in the direction opposite of prevailing winds. Use two 1-1/2" long nails per shingle, with one nail on each side, 6 1/4" back from the exposed end and 1" up from the edge so succeeding shingles conceal nail heads. Trim final shingle to fit and set in plastic cement. Hip and Ridge shingles may also be made from the Tough-Glass® 3-tab shingle. Cut the strip in thirds. Taper the top portion of each slightly so that it is narrower than the exposed portion. See Diagram #8.



12. RE-ROOFING OVER ASPHALT SHINGLES

Replace all missing shingles. Split and securely nail all buckles, raised tabs or curled shingles. Ensure attic ventilation complies with FHA Minimum Property Standards as stated previously. Install a layer of number 30 felt underlayment to maintain a Class A fire rating. Asphalt Felt is to be applied over the old shingles and then proceed with the new shingles as if applying a new roof. The nesting method is also acceptable over flat, uncurled, and secured three-tab shingles. **IMPORTANT: NAILS MUST BE A MINIMUM OF 1-1/2" LONG AND PLACED AS STATED UNDER FASTENING.** See Section 8.

MINIMUM STANDARD SLOPE REQUIREMENT NOT LESS THAN 4 INCHES PER FOOT. LOW SLOPE REQUIREMENT NOT LESS THAN 2 INCHES PER FOOT.

WARNINGS & PRECAUTIONS

WARNING: Roofing application can be dangerous. All necessary precautions and safety guidelines should be observed in accordance with proper roofing trade practices. Every effort should be made to keep roof traffic to a minimum. Regular roof maintenance should be performed in the cooler parts of the day.

Important Precautions: Store on flat surface. Protect from weather during storage and on job site. Sealant protection tape is placed on the back of each shingle and does not have to be removed before applying.

DISCOLORATION: Some shading or variations in the colors may occur due to positioning or embedment of the granule. When asphalt shingles are packaged, they are under a certain amount of pressure due to weight. Minor staining may occur. While in storage, they may also pick up varying amounts of backing material used to keep the shingles from sticking together. These discolorations are temporary and are removed by natural weathering.

DO NOT MIX WITH MATERIAL BEARING DIFFERENT PRODUCT NAME, COLOR NAME, OR OTHER PRODUCT SIZES ON THE SAME ROOF.

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