

**FIRESTONE ULTRAPLY™ TPO SA
APPLICATION GUIDE**

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Firestone UltraPly™ TPO SA Application Guide

I. MEMBRANE APPLICATION

Approved substrates must be clean, dry and free of foreign material such as grease and any debris which could inhibit adhesion. This may require cleaning with a broom or blower. No primers or adhesives required with the Firestone UltraPly TPO SA other than noted below in section 1.01.1.

A. Membrane

1. Position the Firestone UltraPly TPO SA membrane over the approved substrate without stretching.
2. Allow the membrane to relax a minimum of thirty (30) minutes prior to any bonding, seaming or flashing.
3. Position all adjoining sheets in a manner that all sheets overlap a minimum of 2", using the preprinted overlap lines.
4. Position all adjoining sheets in a manner that the seams shed water or run parallel to the flow of water.
5. In order to cover runs greater than 100' (30.5 m); the UltraPly TPO SA sheets may be spliced together using a butt lap or a 2" overlap. A Butt lap shall have no more than 1" gap between the sheet ends. An overlapped end lap shall be no more than 2" wide. The end lap shall be stripped in using UltraPly 8" Reinforced Cover Strip or 60 mil reinforced UltraPly TPO membrane with a minimum 2" weld extending past the perimeter of the end lap. UltraPly TPO Cut Edge Sealant or UltraPly TPO Cut Edge Sealant LVOC is required on cut edges of reinforced membrane used to strip-in the end lap. A butt lap is preferred. UltraPly TPO QuickSeam 9½" Flashing or UltraPly QuickSeam Flashing may be used in conjunction with Single-Ply QuickPrime Primer or Single-Ply LVOC Primer to strip in an overlapping end lap. See appropriate Firestone Technical Information Sheets and Technical Details for specific application information and instructions.

II. MEMBRANE ATTACHMENT

1. NO PRIMER REQUIRED*

*NOTE: Some surfaces such as contaminated walls from a tear-off may require an application of Single-Ply QuickPrime Primer or Single-Ply LVOC Primer to achieve a suitable bonding substrate. The installing contractor should identify the most contaminated area of the substrate and perform an adhesion test to determine if a primer coat is sufficient to seal the surface for the UltraPly TPO SA membrane application.

2. Fold the first half of the membrane with the marks back onto itself without creasing and expose the release liner while maintaining alignment over the adjacent panel.
3. Remove the release liner by pulling at a 45 degree angle, exposing the pre-applied adhesive.
4. Mate the membrane onto the substrate starting in the middle of the panel working out to both edges to minimize wrinkling of the panel.
5. Repeat steps 3 and 4 on the second half of the membrane.
6. **To achieve a preliminary bond**, use a stiff bristle broom and positive downward pressure
7. After the Firestone UltraPly TPO SA membrane is broomed in roll the installed UltraPly TPO SA membrane with a weighted roller (linoleum roller or similar device that achieves 5 lb per linear inch of pressure). Roll the membrane to permanently bond the membrane to the substrate. **All UltraPly TPO SA membrane must be rolled with a weighted roller to achieve a final bond to the substrate.**

8. For subsequent panels, unroll the membrane and allow to relax at least thirty (30) minutes. Position the top membrane to overlap the bottom membrane by 2" using the preprinted overlap lines. End laps are to be no more than 2" wide. Following good roofing practice, make sure the lap is shingled in the direction of the flow of water.
9. Repeat steps 2 through 8, if the seam area has become contaminated with dirt or debris, etc., use a clean rag with Firestone Splice Wash SW-100 to clean the seam area on both sheets. Change rags frequently to avoid depositing previously removed materials. Allow cleaner to dry completely.

III. SEAMING

NOTE: It is very important that both surfaces are clean and no moisture is present on the seaming surfaces.

A. Seaming for Firestone UltraPly TPO SA

1. Position the top membrane to overlap the bottom membrane by 2".
2. Using an approved automatic heat welding machine or hand held heat gun and 2" (50.8 mm) wide silicone or rubber roller, continuously weld a minimum 1 ½" (38.1 mm) wide seam. Firestone recommends that only approved automatic robot welders be used to weld all field seams. See Hot Air Welder Specifications.
3. Seam inspection and scrim sealing.
 - a. All welded seams must be checked manually for voids or seal deficiencies by probing the entire seam area with a dull cotter key extractor after the seam has cooled. In addition, there must be destructive testing performed at the beginning of each workday and every time there is an interruption in the welding process, e.g. power failure, welder shut down, change in job site conditions, or after lunch.
 - b. Any identified deficiencies must be repaired daily to prevent moisture infiltration or contamination.
 - c. Apply UltraPly TPO Cut Edge Sealant or UltraPly TPO Cut Edge Sealant LVOC to all membrane edges with exposed scrim at the rate of 115 linear feet per bottle.

B. T-Joint Areas

NOTE: Special attention must be paid to areas where multiple layers (3 or more) of UltraPly TPO SA come together. UltraPly TPO SA adhesive is not designed for waterproof seaming so these areas need to be addressed with appropriate strip-in details. Refer to Firestone Technical Information Sheets for specific product information.

C. Hot Air Welded UltraPly TPO T-Joint Cover Installation:

1. An UltraPly TPO T-Joint Cover or 4" round field cut of UltraPly TPO Unsupported Flashing shall be used in areas where three (3) or more layers of TPO membrane intersect (T-Joint).
2. Clean the area where the T-Joint Cover will be applied thoroughly with Firestone Splice Wash SW-100. The cleaned area shall be 6" round and have the intersection of the T-joint at the center point.
3. Position the T-Joint Cover so that it is centered on the T-joint.
4. Hot air weld the UltraPly TPO T-Joint cover into place in accordance with Firestone hot air welding requirements.
5. Allow the hot air welding UltraPly TPO T-Joint Cover to cool thoroughly and then probe its edges to be certain of a complete weld.
6. Repair voids or cold welds as necessary to obtain a complete weld between T-Joint Cover and the underlying UltraPly TPO SA membrane.
7. Refer to current Firestone technical details for application requirements for UltraPly TPO General Purpose Sealant around T-Joint Covers.

D. UltraPly QuickSeam TPO T-Joint Patches Installation Instructions:

1. Stir Single-Ply QuickPrime Primer or Single-Ply LVOC Primer thoroughly before using. **DO NOT THIN.**
2. Push the molded handle of the Firestone QuickScrubber into the scrub pad material to embed the micro fasteners into the pad material. Dip the pad into the primer and allow it to saturate with primer.
3. Using a back and forth scrubbing motion apply Single-Ply QuickPrime Primer or Single-Ply LVOC Primer to the T-Joint area to achieve a solidly primed surface without streaks or puddles at the application rate of 200 ft²/gal. Do not overwork the primer or cause globs or irregularities.
4. Allow primer to dry until dry to a finger touch.
5. Position the UltraPly QuickSeam T-Joint Cover so that it is centered over the T-joint intersection. Remove the release paper from the UltraPly Quickseam T-Joint Cover. Fold the UltraPly QuickSeam T-Joint Cover in half and hold by the edges while positioning the cover directly over the exact intersection of the T-joint. Apply the cover to the primed T-joint intersection, starting in the middle and working outward in all directions. Brush your hand across the top of the UltraPly QuickSeam T-Joint Cover to achieve sufficient contact.
6. Using a silicone coated rubber or steel hand roller first hand roll the step-downs of the seams under the UltraPly QuickSeam T-Joint Cover. Then hand roll the entire UltraPly QuickSeam T-Joint Cover.
7. Apply a high profile bead of UltraPly TPO General Purpose Sealant around the entire UltraPly QuickSeam T-Joint Cover.

NOTE: A bead of high profile UltraPly TPO General Purpose Sealant will need to be applied 6" in each direction of the seam area away from the UltraPly QuickSeam T-Joint Cover.

E. Inspect seams, perform any necessary repairs, and apply edge treatment.

1. Inspect all assembled seams daily, and repair any fishmouths or wrinkles in the seaming area by cutting out any raised membrane, laying the deck sheet flat, and repair using one of the following options.
 - a. Apply UltraPly TPO QuickSeam 9½" Flashing or UltraPly QuickSeam Flashing according to current Firestone repair procedures.
 - b. For small repairs (punctures), after priming the repair area, adhere a field-cut 4" x 4" UltraPly QuickSeam Flashing patch that extends a minimum of 2" past the repair area in all directions.
 - c. When a repair requires a cover material larger than allowed for QuickSeam Flashing the area should be repaired using 60 mil UltraPly Reinforced membrane and hot air welding according to current Firestone Repair Procedures.
2. Once the seams have been inspected and any necessary corrections made, apply UltraPly TPO Cut Edge Sealant to all cut edges with exposed reinforcement scrim.
 - a. If the seam area has become contaminated with dirt or debris, etc., use a clean rag saturated with Firestone Splice Wash SW-100 to clean the seam step off area. Change rags frequently to avoid depositing previously removed materials.
 - b. Apply a continuous high profile bead of white TPO Edge Caulk as required along field seams, at field seam intersections, around T-joint covers, and cover tape end laps at the application rate of 15 linear feet (4.6 m) per tube.
3. All UltraPly TPO membrane cut edges with exposed reinforcement scrim require an application of UltraPly TPO Cut Edge Sealant by the end of the workday. Failure to seal the cut edge of the UltraPly TPO membrane may allow moisture to wick into the scrim and result in a leak source.

III. PERIMETER AND BASE MEMBRANE SECUREMENT

- A. Regardless of the method used to secure the field of the roofing membrane, some points on every roof require additional membrane securement. These areas include roof perimeters (parapets, transitional walls and edges), deck angle changes in excess of 2"/12" (including drain sump areas), all curb-type roofing penetrations, pipe-type penetrations greater than 12" (304.8 mm) in diameter, both sides of expansion joints and other areas where the membrane must be anchored to prevent movement, stress or damage to the roofing membrane. Refer to the current Firestone details and specifications.
1. **Perimeter Attachment.** Firestone Roofing Systems offers several different types of attachment methods. Base attachment is required at each roof level, curb, skylight, expansion joint and roof penetrations over 12" in diameter or any angle change in slope or combined slopes that exceed 2" in 12".
- B. Wood nailers provide a termination point for roofing insulation as well as a securement point for base flashing securement. Wood nailers are not covered by the Firestone warranty because they are a product by others and considered part of the building structure. Following are Firestone requirements for wood nailers:
1. Wood nailers are required at all roof edges where sheet metal work, drip edges, or gutter systems are specified. The width of the nailer must exceed the width of the flange of any sheet metal work mounted to it and be of equal thickness to the roof insulation in order to protect the edge of the insulation and provide a substrate to which the sheet metal work can be anchored, without impeding drainage. Wood nailers are also required under any rooftop curbs that are not mounted directly to the structural deck with the same width and thickness requirements stated above.
 2. Wood Nailers must be #2 Grade or better lumber. Wood treated with preservatives containing creosote, asphalt, pentachlorophenol, copper naphthenate, copper 8-quinolinolate, and alkaline copper quatenaries (ACQ) have an adverse effect on single-Ply roofing membranes and are not acceptable for use in a GenFlex roofing system.
 3. In all cases, the wood nailer must be anchored to the deck in an industry accepted method to the designing architect's specification. As a minimum standard, the wood nailers must be anchored sufficiently to resist 200 lb (889.6 N) of force per linear foot in any direction with fasteners spaced not more than 24" (609.6 mm) apart. Refer to the Perimeter Flashing portion of Factory Loss Prevention Data 1-49 (February 1985, revised September 2000) for nailer securement recommendations. Wood nailers are not part of the Firestone roofing system and are not covered by the Firestone warranty.

IV. FLASHINGS

- A. Roof perimeter flashing and flashing around vents, skylights and miscellaneous roof projections must utilize UltraPly TPO Flashing accessories to the greatest extent possible. Field fabricated detail flashings using Non Reinforced TPO Flashing are acceptable only when a pre-molded flashing is not feasible, such as on pipes without top access.
- Firestone Roofing Systems offer numerous options for flashing. See our standard details
1. Vertical Membrane Flashings (Parapets, Transitional Walls, Curbs, etc.)
Walls, parapets, and/or curb flashings may be completed using Firestone UltraPly TPO SA membrane. The leading edge on the roof membrane must be heat welded.
 2. Flashing penetrations passing through the roofing membrane.
 - a. Flash all pipes with UltraPly TPO pre-molded pipe flashings to the greatest extent possible. Field fabricates pipe flashings with UltraPly TPO unsupported Flashing per standard Firestone Roofing Systems details when a pre-molded flashing is not feasible.
NOTE: All existing flashings must be removed before applying a new flashing.
 - b. A complete line of UltraPly TPO QuickSeam accessories may be used in conjunction with the UltraPly TPO SA system.

- B. Expansion Joints and Building Control Joints.
 - 1. Consult Firestone Roofing Systems standard details for various application methods.
- C. Penetration Pockets
 - 1. Fill penetration pockets in accordance with Firestone Roofing Systems standard details:
- D. Roof Drains
 - 1. Consult Firestone Roofing Systems standard details.
 - 2. Prepare substrate around each roof drain to prevent membrane bridging or distortion and to provide a smooth transition from the roof surface to the drain clamping ring.
 - 3. The surface between the clamping ring and the drain must be clean and smooth. Remove all existing flashing, cement or lead on retrofit projects down to bare clean metal.
 - 4. Apply one (1) complete tube of Firestone Water Block Seal S-20 between drain bowl compression flange and the underside of the new membrane before compressing the new membrane to drain bowl assembly, with the compression ring mounted on the top surface of the new membrane. The detail is only complete when the water stop is fully compressed between the new membrane and the flange of the drain bowl, forming a solid seal between the two. Be careful to compress the assembly evenly to avoid cracking or breaking the drain compression ring. Cracked or broken drain compression rings may result in a reinspection of the finished roof system to make certain corrective measures have been made before Firestone will accept the roof system for warranty coverage.
 - 5. **All bolts and/or clamps must be in place in order to provide constant, even compression.** Missing drain bolts may result in a reinspection of the finished roof system to make certain corrective measures have been made before Firestone will accept the roof system for warranty coverage.
 - 6. Do not run seams through roof drains or sumps. If a seam is run through a drain sump, cut the membrane with the assembled seam outside of the drain compression ring area, and install a target patch of new membrane extending a minimum of 3" outside of the sump area and seamed into the field membrane, using Firestone standard hot air welding procedures. Apply UltraPly TPO T-Joint Covers and UltraPly TPO Cut Edge Sealant as required at the target patch and to seam intersections in accordance with Firestone Details.
- E. **Scuppers**
 - 1. Scuppers are to be constructed according to criteria detailed in the Sheet Metal and Air Conditioning Contractors National Association (SMACNA) Manual.
 - 2. As a minimum, Firestone requirements regarding scuppers are as follows: the scupper assembly must be fabricated from a minimum of 24 ga G-90 steel, 0.040" aluminum, or UltraPly TPO Coated Metal and be sized to fit snugly through the wall opening. All joints must be sealed according to SMACNA standards, and the scupper must include a continuous 3" wide interior face flange with continuous rounded corners. The scupper must also be of sufficient length to extend through the exterior wall by at least ½" and be capable of being sealed on the exterior of the building to prevent backflow into the roof system or wall cavity.
 - 3. In addition to the above, if a scupper is to be mounted at the deck to wall or parapet junction, a wood nailer of equal thickness to the roofing insulation must be secured to the structural deck below the scupper flange to provide a suitable mounting surface for the scupper.
 - 4. Cut the flashing membrane tightly to the scupper opening in the wall.
 - 5. Apply a heavy bead of Water Block Sealant S-20 around the scupper opening (15 lf (4.6 m) per tube).
 - 6. Insert the scupper sleeve into the scupper opening, and press the mounting flange into the Water Block Sealant S-20.
 - 7. Secure the flange to the substrate with an appropriate fastener.
 - 8. Flash scupper in accordance with the appropriate current Firestone scupper detail.

F. Sheet Metal Work

1. Sheet metal work is not waterproofing. The installed membrane and roofing system must be made watertight before metal application.
2. No roof system is complete until all the edges are terminated in such a way as to prevent water infiltration into the roofed structure. This typically involves the use of manufactured or shop fabricated metal detailing, such as coping caps, gravel stops, roof edging, flashing and counter-flashing components. All sheet metal work should be fabricated and installed according to SMACNA and National Roofing Contractors Association (NRCA) guidelines. Unless specifically agreed to in writing by Firestone Quality Building Services Group prior to installation, sheet metal work manufactured by others is not included in the Firestone warranty coverage.
3. The designer and roofing contractor should be aware that many municipalities and states are beginning to enforce metal codes that, until recently, were merely used as guidelines. These metal codes relate to minimum standards on material, fabrication, and testing of roof related sheet metal work. It is the contractor's responsibility to review and know the building codes relating to their roofing projects in order to avoid costly remedial work to bring a project into compliance.
4. If the sheet metal work on a project is specified by the designer to be included in a full system warranty, use Firestone brand edge metal and coping products. Contact your Regional Sales Manager or Sales Representative for information.
5. If a metal flashing product by others is submitted via a deviation request for inclusion in the warranty coverage, the following are minimum requirements for consideration:
 - a. The sheet metal work must be shop or factory formed or extruded.
 - b. The sheet metal work must be configured and installed in accordance with SMACNA guidelines and NRCA installation instructions.
 - c. Minimum requirements regarding sheet metal work material are 24 ga. (0.61 mm) G-90 Kynar pre-finished steel or 0.040" (1.02 mm) aluminum (mill finished, pre-finished or anodized).
 - d. A deviation request for inclusion of sheet metal work in warranty coverage must accompany the PIN form submitted by the installing contractor.
 - e. The deviation request must include shop drawings of the sheet metal work to be included and a roof plan showing the installed location and linear dimension for each profile.
 - f. Should the deviation request be granted, the installing contractor will be responsible to Firestone Roofing Systems for a period of two-years from the date of Firestones inspection and acceptance under their installers agreement.
6. Sheet metal work installation, regardless of material source, must be according to the sheet metal work manufacturer's instructions available from the manufacturer or supplier.
 - a. Sheet metal work formed by roofing contractors must be fabricated and installed in accordance with SMACNA and NRCA recommendations. All flange-mounted sheet metal work must be flashed according to the appropriate Firestone material type's standard details. Sheet metal work formed by contractors is not eligible for warranty coverage unless the conditions listed under item "C" above are met and Firestone accepts the sheet metal work for warranty coverage in writing.
 - b. Sheet metal work by roofing contractors must have metal joints stripped-in to the uppermost edge of the metal dam on the roof side.
 - c. UltraPly TPO projects using UltraPly TPO QuickSeam Flashing to strip-in sheet metal work with a gravel dam (or a formed configuration that is capable of holding water on the edge of the installed cover tape) must have UltraPly TPO General-purpose Sealant applied on both sides of the cover tape.
 - d. Gravel stop style sheet metal work on UltraPly TPO roof systems may be fabricated from UltraPly TPO Coated Metal in order to provide a suitable welding surface to seal the roof system to the sheet metal work. As an alternative on some UltraPly TPO applications, it may be appropriate and permissible to use a two-piece snap on fascia assembly instead of UltraPly TPO Coated metal.

7. The approval of sheet metal work for inclusion in warranty coverage is conditional upon acceptance by Firestone Roofing Systems, and, if approved, is subject to the “terms, conditions and limitations” of the requested warranty. Under no circumstance will any warranty coverage for sheet metal work exceed the wind speed limitation of the warranty issued for the roof system. Aesthetic appearance is expressly excluded from warranty coverage.
8. Sheet metal work by others is not permitted on projects requiring full system warranties and wind speed coverage equal to, or greater than, 90 mph.

G. Night Seal

1. Consult Firestone Roofing Systems standard details.
2. At the completion of each day’s work, a watertight seal must be established at any loose edge of membrane with an appropriate sealant. Care must be used to guarantee that no water flows beneath any completed sections of roof. Consult Firestones Roofing Systems standard night seal detail for method of attachment. Membrane contaminated with the sealant used as a night seal must be cut out and discarded prior to resumption of work.

V. WALKWAYS

1. Consult Firestone Roofing Systems standard details.
2. Walkways are required at all access points to the roof system and recommended anywhere routine (routine is defined as once a month or more) traffic on the membrane surface is anticipated. Walkway pads are used to protect the weatherproofing membrane from damage or excessive wear and tear. Traffic-related roof damage is not covered by the Firestone warranty. In areas of extreme traffic, contact Firestone for options to enhance the roof system in order to prevent or mitigate traffic-related insulation damage. Walkway maintenance is the responsibility of the building owner because walkway pads are not part of the warranted waterproofing assembly.
3. Should access to the roofing membrane be required in order to perform warranty service to the roof system, only Firestone brand walkway pads will be moved and replaced as necessary to perform service at Firestone’s expense. Pavers, walkway systems, patio surface components and other products neither manufactured nor supplied by Firestone Roofing Systems that impede roof system service must be removed and replaced at the building owner’s expense.

VI. FINISHED ROOF PROTECTION

1. When it becomes necessary for other trades to work over a completed area of new roof, the roofing membrane and flashing must be protected from physical damage. Proper and adequate protection includes installing a slip-sheet in the work area overlaid with plywood or OSB, in order to dissipate the effects of traffic on the finished roof surface and to prevent impact damage to the system caused by dropped tools and/or equipment. If damage does occur to the roof system, it must be repaired immediately in order to preserve the integrity of the roof system. If membrane is damaged in more than six (6) locations within a 100 ft² (9.3 m²) area, new membrane extending 6" (152.4 mm) beyond the border of the damaged areas must be installed over existing membrane in accordance with Firestone specifications. For fully adhered and mechanically attached applications, the membrane must be fully bonded to the existing underlying membrane with an approved repair method. Contact the Firestone Technical Department with any questions on how to address comprehensive damage.