

# STEVENS ROOFING SYSTEMS

## STONE BALLASTED STEVENS EP™

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# CSI Division 7 Guide Specifications

# STONE BALLASTED

# STEVENS EP™

## PART 1 - GENERAL

### 1.01 Description

- A.** Furnish and install ballasted Stevens EP Roofing System in accordance with drawings and specifications approved by Stevens Roofing Systems (Stevens).

#### Special Conditions

1. This specification is intended for building roofs that have deck structures having sufficient load-bearing capacity and meeting guidelines herein and have no abnormally severe or unknown environmental exposures, e.g. coastal winds, interior positive pressure or certain chemicals, except as specifically authorized herein.
2. Applications that involve severe exposures (ASCE ground roughness category D Exposure) require review by Stevens Roofing Systems Technical Review Dept. before any specification is valid (*Reference Table 2, ASCE Exposure Classification Chart*).

**WARNING:** Buildings operating with interior positive pressure at the deck require review by Stevens Technical Review Dept. before any specification is valid.

- B. Related work:** Metal work other than Stevens Edge Metal Systems is not covered by Stevens for warranty. Metal work must be secured in a manner approved by Stevens and/or in accordance with SMACNA guidelines to prevent damage from buckling or wind exposure. All metal work that is part of the waterproofing envelope must be sealed, structurally sound, and appropriately anchored to prevent leakage.

### 1.02 Quality assurance

- A.** Apply roofing system using a roofing applicator authorized by Stevens.
- B.** Stevens EP membrane is classified by Underwriters Laboratories as a Class A sheathing material for use in construction of Class A roofing assemblies. See UL's *Roofing Materials and Systems Directory* for specific assemblies.

- C. Inspection:** Upon completion of the membrane installation and **before the application of the ballast over the seam areas**, an inspection shall be performed by a representative of Stevens to ascertain that the roofing system has been installed according to Stevens approved specifications and details. The applicator shall provide temporary ballast and protection as necessary but maintain all seams uncovered until an inspection by Stevens confirms that the project is ready for the application of ballast. When the ballast is in place Stevens shall perform the job completion inspection. Upon approval of the project, a Warranty shall be written.
- D. Changes:** Should there be deviations or changes from this specification without written approval from Stevens, the project is not authorized for installation and is not eligible for Warranty.
- E.** All Stevens EP membrane is manufactured in an ISO-9001:2000 facility.

### 1.03 Submittals

- A.** Minimum job file submittal information for consideration for labor and material warranty coverage shall be an accurately completed Request for Warranty form ([www.StevensRfw.com](http://www.StevensRfw.com)) and the information discussed in paragraph B following.
- B.** Samples and data sheets of all materials not supplied or approved by Stevens shall be submitted to Stevens for written approval prior to the start of installation. Authorized applicators must submit a roof drawing indicating which details will be employed in the project. These drawings shall be approved by Stevens prior to the start of work. These must include: outline and size of the roof, location and type of penetrations, perimeter and penetration flashing detail references, and a copy of any nonstandard details to be used. Details which do not conform to Stevens standard SR Detail Drawings must be shown as to their anticipated construction.
- C.** For a Limited Membrane Material-Only Warranty, the Request for Membrane Warranty form is the only submittal required.

## 1.04 Delivery and storage

- A. All materials provided by Stevens shall be delivered with appropriate packaging labels indicating warnings, storage conditions, lot numbers, and usage instructions.
- B. Materials shall be stored in their original undamaged packaging and storage conditions shall be maintained in accordance with the manufacturers' requirements.

## 1.05 Precautions

- A. Adhesives, solvents, and caulks as indicated are extremely flammable and/or toxic. Follow precautions indicated on container or packaging labels.
- B. Surfaces to be bonded shall be dry, clean and free of debris. Suitable surfaces are usually considered to be smooth; solid masonry, wood, and metal.
- C. All fasteners should be installed with a depth-sensing screw gun to prevent overdriving or underdriving. The ASAP and PIF adapter tools are recommended for installing Stevens ASAP and Stevens PIF Fasteners.
- D. Block off or shut down positive pressure building ventilation systems during application to prevent sheet from billowing during application.
- E. For buildings with canopies or large wall openings, e.g. hangar doors and truck entrances or docks, which are subject to positive pressurization from wind, or from air handling systems, consult Stevens for suitability of application and possible design enhancement requirements.
- F. Job specification and retrofit preparation should always include provision to ensure positive drainage in all areas. Good roofing practice does not permit uncontrolled, uncollected drainage over the edge of a roof.
- G. All rooftop mechanical units are to have their condensation lines piped to drains, or off the roof.
- H. Grease shall not be allowed to accumulate on the roof. If rooftop grease units are not to receive a continual maintenance program they are to have an approved grease containment system specified.
- I. At the discretion of Stevens, excessive patching as a result of damage to the Stevens EP membrane or caused by faulty installation may require total recover in those areas.
- J. Provide temporary ballast in partially completed sections to control wind effects during construction.

## 1.06 Warranty

- A. A Stevens representative shall inspect the installation for compliance with Stevens specifications prior to the application of the ballast. If ballasting prior to this inspection is necessary, row ballasting or spot ballasting is acceptable providing all seams are left exposed. After ballasting is completed Stevens will perform the job completion inspection.
- B. Upon acceptance of the roofing system installation, a Stevens Standard Warranty will be issued for a five (5), ten (10) or fifteen (15) year period that covers wind damage at up to gale force winds.
- C. Reference General Warranty section of the Stevens Technical Manual CD-ROM for more information.

## PART 2 - PRODUCTS

### 2.01 General

- A. All material shall be furnished, specified or approved in writing by Stevens. Samples of all materials used on the project that are not supplied by or approved by Stevens shall be furnished to Stevens for written approval prior to the start of work.

### 2.02 Membrane

- A. Membrane for roof cover shall be .045-in., .060-in. or .080-in. (Stevens EP-XL) nominal thickness overall, scrim reinforced, Ethylene Propylene-based sheet 76.5-in. wide by appropriate length conforming to the minimum physical properties in [Table 1, Physical Properties Chart](#). (Factory fabricated 10-ft. and 12-ft. widths are also available for .045- and .060-in. thick materials only. Contact Stevens Technical Review Dept. for more information.) Stevens EP membrane is available in White, Light Slate Gray, Pewter, Buckskin, Desert Brown, Terra Cotta, Patina, Dark Ivy Green and Neon Blue. Contact your Stevens Representative for color, thickness options, minimums and lead times. Stevens EP Membranes meet the ASTM 6878-03 specification for TPO-based roofing material. Packaging to bear the UL label.

### 2.03 Related Materials

- A. **Insulation/underlayment/recover board:** Stevens supplies a wide range of insulations, underlayments and coverboards to

**Table 1 - Physical Properties - Stevens EP**

Physical Property	Test Method	Typical Values 45 mil* (1.14 mm)	Typical Values 60 mil* (1.52 mm)	Typical Values 80 mil* (2.03 mm)
Breaking Strength	ASTMD-751	275 lbf.(1.2 kN)	320 lbf.(1.4 kN)	390 lbf. (1.7 kN)
Tear Strength	ASTMD-751 Procedure B, 8"x8" sample)	135 lbf.(.60 kN)	110 lbf.(.49 kN)	104 lbf. (.46 kN)
Dimensional Stability (% change max.)	ASTM D-6878 (white: 6 hrs. @ 158°F/70°C)	±0.3	±0.3	±0.2
Hydrostatic Resistance	ASTMD-751 (Method A)	400 psi (2.8 MPa)	425 psi (2.9 MPa)	510 psi (3.52 MPa)
Ozone Resistance**	ASTMD-1149 (70 hrs. @ 100°F/37.8°C)	Pass	Pass	Pass
Weather Resistance	Xenon Arc, ASTMD-6878 G-155; 5040 kJ/m <sup>2</sup> 0.35w/m <sup>2</sup> @ 340nm	No cracks, loss of breaking strength, or tear strength	No cracks, loss of breaking strength, or tear strength	No cracks, loss of breaking strength, or tear strength
	EMMAQUA (Concentrated Natural Sunlight) (ASTM G-90) 167 MJ/m <sup>2</sup> total UV radiant exposure	Pass	Pass	Pass
Puncture Resistance	FTM 101B (Method 2031)	330 lbf. (1.5 kN)	400 lbf. (1.8 kN)	500 lbf. (2.2 kN)
Water Vapor Transmission	ASTM E-96 (Procedure B Condition BW @ 72°F/22.2°C)	0.035 Perms	0.035 Perms	0.035 Perms
Elongation (%) Ultimate**	ASTMD-412 (Die C)	700%	700%	700%
Brittleness	ASTMD-2137 @ -49°F/-45°C	Pass	Pass	Pass
Water Absorption (max. % weight change)**	ASTMD-6878 D-471, (158°F/70°C for 7 days) Testing only one side section	±3	±3	±3
Heat Aging	ASTMD-6878 D-573 (28 days @ 240°F/115°C)	Break: 275 lbf. (1.2 kN)	Break: 320 lbf. (1.4 kN)	Break: 350 lbf. (1.56 kN)
Solar Reflectance (initial)	ASTM E-903	>70%	>70%	>70%
Thermal Emittance	ASTME-408	>0.93	>0.93	>0.93

\*Thickness (nominal) per ASTM D-751 test method.

\*\*Test performed on non-reinforced Stevens EP membrane.

satisfy a broad spectrum of design conditions. Only Stevens brand insulation products will be eligible for Total System Warranty coverage; products other than Stevens will incur a premium warranty fee. (*Reference Appendix MA-B, Stevens Approved insulation List and Fastening Rates for Mechanically Attached Systems*).

1. **Stevens ISO 2000:** Closed-cell HCFC FREE “Green” polyisocyanurate foam core manufactured using (HCFC) (ACUltra Hydrocarbon) blowing agent and integrally laminated to heavy non-asphaltic fiber-reinforced felt facers; compressive strength - (20 psi) (25 psi). Available in flat stock and tapered panels. (*Reference Stevens Product Specification Data Sheets for additional information*).
2. **Stevens ISO 3000:** Closed-cell HCFC FREE “Green” polyisocyanurate foam core manufactured using (HCFC) (ACUltra Hydrocarbon) blowing agent and integrally laminated to heavy coated-glass facers; compressive strength - (20 psi) (25 psi). (*Reference Stevens Product Specification Data Sheets for additional information*).
3. **Stevens ISO Recover Board:** Closed-cell HCFC FREE “Green” polyisocyanurate

foam core manufactured using (HCFC) (ACUltra Hydrocarbon) blowing agent and integrally laminated to heavy coated-glass facers; compressive strength - (20 psi) (*Reference Stevens Product Specification Data Sheets for additional information*).

4. **Stevens Extruded Polystyrene (XPS):** Extruded polystyrene closed-cell foam panel with continuous skin on face and back surface that meets ASTM C-578, Standard Specification for Rigid Cellular Polystyrene Thermal Insulation. (*Reference Stevens Product Specification Data Sheets for additional information*).
5. **Stevens Expanded Polystyrene (EPS):** ASTM C578-04a expanded polystyrene thermal rigid board insulation with a minimum density of 1.25 lbs./cu.ft.(ft3). (*Reference Stevens Product Specification Data Sheets for additional information*).
6. **DensDeck® Roof Boards:** (*Reference Stevens Product Specification Data Sheets for additional information*).
  - a. G-P Gypsum Corporation 1/4-in. DensDeck Roof Board, 1/2-in DensDeck Roof Board and 5/8-in.Type X Roof Board. Nonstructural, glass mat faced gypsum panel with water-resistant core

available in 4-ft.x8-ft. sizes and 4-ft.x4-ft.sizes

- b. G-P Gypsum Corporation 1/4-in. DensDeck Prime Roof Board, 1/2-in. DensDeck Prime Roof Board and 5/8-in. DensDeck Prime Roof Board (Type X). Glass mat faced gypsum with non-asphaltic, highly filled proprietary heat-cured coating on one side available in 4-ft.x8-ft. and 4-ft.x4-ft. sizes.
- c. G-P Gypsum Corporation 1/4-in. DensDeck DuraGuard, 1/2-in. Densdeck Duraguard and 5/8-in. DensDeck Duraguard. Glass mat faced gypsum panel with blue low-perm, durable, integrated-coating on one side and coated glass mat on the back available in 4-ft.x8-ft. and 4-ft.x4-ft. sizes.

## B. Adhesives, Sealants, Primers and Caulks:

1. **Stevens EP (TPO) Bonding Adhesive:** Stevens EP (TPO) Bonding Adhesive is designed for bonding Stevens EP membranes to wood, metal, masonry, and approved roof insulation board surfaces. Stevens EP (TPO) Bonding Adhesive **is not** approved for use with other roofing membrane types.
2. **Stevens All-Purpose Sealant:** Stevens All-Purpose Sealant is designed to be used as a water cutoff mastic, sealant to top off pitch boxes, and an exterior grade caulk for metal work.
3. **Stevens EP Cut-Edge Sealant:** Stevens EP Cut-Edge Sealant is a solvent-based caulk developed to seal exposed cut edges of reinforced membrane.
4. **Stevens Insulation Adhesives:** Stevens offers multiple insulation adhesive options.
  - a. Stevens Insulation Adhesive is a VOC-free, one-part, rising, moisture-cure foam that is poured from 1 or 2.5 gallon cans on the substrate.
  - b. Stevens-Olybond 500 is a two part, polyurethane low rise foam that is applied in ribbons with appropriate dispensing equipment.
  - c. Stevens-Olybond Classic is a two part, polyurethane low rise foam that is spray applied to fully cover the substrate.

Stevens Insulation Adhesives are designed for bonding most insulation and recover boards to a wide range of substrates and other insulation boards. Please consult

the appropriate Product Specification Data Sheet for detailed information.

5. **Stevens EP Seam Cleaner:** Stevens EP Seam Cleaner is a surface cleaner for use with Stevens EP membranes which have become dirty or contaminated prior to heat welding.
- ## C. Mechanical fasteners:
- Shall be supplied by Stevens.
1. **Membrane:**
    - a. Refer to *Appendix A, Stevens Fastener Selection Guide* to select appropriate fastener/plate combination and approved fastening rates . Also, Stevens Product Data Sheets can be found on the Stevens Technical Manual CD-Rom.
    - b. For gypsum, cementitious woodfiber decks (“Tectum”) and light-gauge metal panel roofs, fastener pull tests must be submitted to Stevens Technical Review Dept. with the project Request for Warranty form (RFW).
  - D. **Termination bar:** Stevens Termination Bar fastened 6-in. o.c. is the only authorized product.
  - E. **Stevens Edge Metal Systems:** Stevens Edge Metal must be installed per standard SR Detail Drawings.
  - F. **Prefabricated Stevens EP Pipe Boots:** Are provided as alternatives to .055-in. unsupported flashing for vent stacks and pipes 1-in. to 6-in.
  - G. **Prefabricated Stevens EP Corners:** Are provided as an alternative to .055-in. unsupported flashing for use at outside and inside corners.
  - H. **Stevens EP Flashing Tape:** 6-in. wide x 70-mils thick, packaged in 100-ft. rolls. This product is made with unsupported membrane with a butyl tape backing (with a release paper) and is the preferred method for stripping-in non-Stevens gravel stop and drip edge metal (not for use on Stevens Clad Metal). Flashing Tape eliminates the need for Stevens (TPO) Bonding Adhesive and Stevens All-Purpose Sealant when completing edge flashings. Surfaces must be prepared with Stevens Tape Primer prior to Flashing Tape application.
  - I. **Ballast:** Reference [Section 3.03 Ballast Requirements](#) in this specification for ballast size and weight requirements.

## PART 3 - EXECUTION

### 3.01 Substrate preparation

- A.** The applicator shall be responsible for the suitability of the substrate to accept Stevens EP membrane. In reroofing, test cuts shall be made by the roofing applicator to determine existing condition and deck suitability. All noticeably damp, wet or deteriorated materials must be removed. In all cases, prior to the start of work, the substrate shall be smooth and free of debris, sharp edges, and other surface irregularities. Any unevenness or joints gapped greater than 1/4-in. in the membrane substrate can cause inconsistent membrane welds and must be avoided. Maximum slope allowed is two (2-in.) in twelve inches (12-in.).
- B. Steel deck, wood plank, and light-weight cementitious decks:** Shall be covered with an approved insulation (*Reference Appendix MA-B, Approved Insulation List & Fastening Rates*). Polystyrene boards may require a thermal barrier underlayment over steel decks. Consult manufacturer and local building codes.
- C. Concrete, plywood or flat sheet metal surface:** Surface shall be dry, flat, clean, smooth, free of sharp edges, and suitable for acceptance of Stevens EP membrane. Plywood must be exterior grade with an A or B finish side up and with no joints gapped greater than 1/4-in. Consideration should be given to installing slip plates over all gapped or uneven joints where membrane seams will cross to minimize welding inconsistency. Thickness, structural grade, fastening, and fire resistance requirements should meet the requirements and recommendations of applicable building codes and the APA and are the responsibility of the owner and the installer. Concrete must be dry, fully cured, and prepared smooth with dust removed. The membrane shall have a fastened expansion joint detail (as per standard SR Detail Drawings) where deck joints exceed 1/4-in. or when crossing a building expansion joint.
- D. Reroofing over existing roof:** The specifier and/or applicator shall determine the condition of the existing roof. Significantly deteriorated decking must be repaired or replaced, as appropriate. Wet materials (containing free moisture that would evaporate if exposed to atmosphere) must be found and replaced. Existing surface shall be dry, reasonably

smooth and even, blisters cut, and loose aggregate removed prior to installation of approved insulation board.

- E. Vapor retarder:** Is not required for protection of Stevens Roofing System membrane. As a guideline, the National Roofing Contractors Association states, "...vapor retarders should be considered for use when both of two conditions are anticipated: (1) the outside mean, average January temperature is below 40°F (4.4°C), and (2) the expected winter, interior relative humidity is 45 percent or greater."

**NOTE:** In all high humidity situations consult Stevens Technical Review Dept. and the insulation manufacturer for specific application requirements.

- F. Nailers:** Pressure preservative treated, wooden nailers shall be installed at gravel stops or drip edges.
- 1. Reroofing:** Use #2 or better wood treated for rot resistance. Creosote and asphaltic preservatives are not acceptable.
  - 2. New roofing:** As specified by architect. A treated wood nailer is recommended. Effective perimeter attachment must be achieved per approved details.
  - 3. All construction:** Nailer shall be anchored with a suitable fastener for the application having a minimum withdrawal resistance of 100-lbs., staggered 6-in. o.c. within 8-ft. of an outside corner, and 12-in. o.c. along other perimeter areas.
  - 4. All construction:** Nailer thickness shall be chosen to match the top surface of adjacent construction  $\pm 1/4$ -in. This permissible variation shall not contribute to ponding.
  - 5. Nailers** around skylights, curbs, expansion joints, etc., are not required. Use of Stevens fastener and plates anchored to deck 12-in. o.c. through membrane and insulation is acceptable.
- G. Existing flashings:** Must be removed and completely cleaned off wherever new Stevens Roofing System terminations and water stops are to be installed. Existing flashings may be left in place up to Stevens termination areas when in good structural condition and solidly attached to substrate.
- H. New construction or reroof with complete tearoffs of flashings:** The applicator is responsible for the suitability of the substrate surface for the Stevens EP membrane.

The substrate shall be smooth and free of sharp edges and other surface irregularities that prevent the flashing membrane from being 100% adhered.

### 3.02 Application procedures

**NOTE:** For insulation application and suitability, refer to **Appendix MA-B, Stevens Approved Insulation List & Fastening Rates.**

#### A. Insulation or protection board:

- 1. Minimum thickness:** Shall be approved in writing by Stevens. Since the insulation requirement for thermal value will vary for each project, the thickness of the insulation must be calculated for the desired results.
- 2. Compatibility:** Certain insulations such as polystyrene are not compatible with coal tar pitch. Contact insulation manufacturer for recommendations. Certain polystyrene insulations are also not suitable for use directly under Stevens EP Colors or Stevens EP Black membrane and require an overlayment (*Reference Appendix MA-B, Approved Insulation List and Fastening Rates*).
- 3. Manufacturer's instructions:** In regard to compatibility and spanning of metal flutes, the manufacturer's specifications shall determine the suitability for an application, subject to acceptance by Stevens.
- 4. Precautions:** Be careful when handling insulation to avoid damaging or rupturing the facer and/or surface. All damaged areas must be cut out and replaced with structurally sound insulation.
- 5. Tapered insulation:** Most tapered insulation systems taper down to a minimum 1/2-in. thickness only. Therefore, a tapered edge strip of high density fiber board should be used to provide a smooth transition to the flat areas.
- 6.** Approved insulation boards shall be installed with the longest dimension perpendicular to the direction of the membrane seams whenever possible and installed with end joints staggered. Boards will be butted as closely as possible with no gaps over 1/4-in.

#### B. Membrane installation procedures:

- Approved insulation shall be loose laid with joints staggered over roof area to be covered. Boards will be butted as close as possible, and voids greater than 1/4-in. shall be filled.

- Stevens Field Sheet membrane shall be unrolled on the area to be covered, with a minimum 2-in. overlap from the edge of the previous roll of membrane.
- Membrane must be mechanically attached 12-in. o.c. at all perimeters, and at any penetration that has a dimension of 24-in. or greater with Stevens fasteners and plates (*reference Appendix A, Stevens Fastener Selection Guide*). At perimeters that are to receive a gravel stop or metal edging the Stevens EP membrane must be brought over the outside edge and terminated 12-in. o.c. unless otherwise stated in the appropriate standard Stevens Detail Drawing.

#### C. Lap splice: Membrane shall be overlapped and hot-air welded without any contaminants (adhesive, dirt, debris, etc.) in the seam.

- 1. Hot-air welding:** An automatic hot-air welder and hand-held welder which are functionally in top condition are a necessity for Stevens applications. Small work and repairs can be done efficiently with the hand-held welders however, hand-held welders are not a recommended means of field seaming.
- 2. The entire lap edge must be probed** with approved seam probing tool (Sears cotter pin extractor) after it has cooled completely to verify seam consistency. Probing before the seam area has cooled will damage the membrane. In addition, destructive tests performed daily on a 3-in. wide area of seam weld to verify sufficient peel strength. A properly welded seam will have membrane delamination from scrim prior to weld failure. Destructive test welds should be conducted for the first seam of the day, first seam after the robot welder had been allowed to cool down, and after any extreme changes in weather conditions. Cut edges shall be caulked by applying Stevens EP Cut-Edge Sealant from a squeeze bottle.

#### 3. T-Seams

- a. Definition:** The point where two perpendicular lap seams intersect is called a "T-seam" and if T-seams are not properly welded, a seam void may result.
- b.** For .045-in. and .060-in. membrane, T-seams should be properly creased in at the step-off area, using a hand roller. For T-seam locations that have not been welded properly, a patch is required. Patches shall be a minimum of 4-in. in

diameter and can be either .045-in. reinforced Stevens EP membrane or .055-in. unsupported membrane.

- c. For Stevens EP-XL (.080-in. thick membrane), a patch is required on all T-seam locations.

**4. Stevens EP Membrane, as with any material after exposure, will require cleaning prior to seaming.** The approved method for cleaning Stevens EP membrane prior to welding is as follows:

- a. Remove any visible dirt and debris with a clean rag and water. For heavily contaminated surfaces, scrubbing with a detergent cleaner (i.e. Fantastik® or 409®) followed by a water rinse may be necessary.
- b. With a clean scrub pad saturated with Stevens EP Seam Cleaner aggressively agitate the seaming area. With a clean white rag, follow with a final one swipe pass over the seaming area, careful to not redeposit any contaminants back onto the cleansed sheet surface.
- c. Allow Stevens EP Seam Cleaner to completely flash off (i.e. membrane should be completely dry).
- d. Follow the standard welding procedures with an approximated 20% reduction in speed.
- e. Final weld strength may not be achieved for several days.

**D. Perimeter fastening:** Wood nailers are required for perimeter gravel stops or drip edges. Membrane may be fastened at other transitions using Stevens-approved fastener and plate combinations (*Reference Appendix A, Stevens Fastener Selection Guide*).

**1. Wooden nailers:** See 3.01.F.

**2. Base of Parapet or Curb:** Membrane shall be mechanically fastened 12-in. o.c. through insulation (and existing roof in reroofing) into deck. Fastening shall occur at parapet wall, curbs, skylights, expansion joints, and any other roof penetrations that exceed 24-in. in any dimension (*Reference specific SR detail drawing for fastener locations*).

**E. Flashing:** Perimeters, curbs, vents, expansion joints, drains, and other details shall be flashed as shown in Stevens standard SR Detail Drawings. Under no condition shall flashings cover weep

holes or any form of through wall drainage.

1. Apply Stevens EP (TPO) Bonding Adhesive to both underside of flashing membrane and surface to which it is to be bonded, at a rate of approximately one gallon per 60 square feet (when applied to two surfaces).

**NOTE: Stevens EP (TPO) Bonding Adhesive shall not be applied to membrane surfaces that are to be hot-air welded. Hot-air welding shall be used throughout the system where Stevens Membrane overlaps itself.**

2. Stevens EP (TPO) Bonding Adhesive shall be allowed to dry until tacky until it does not string or stick to a dry finger. Roll the flashing into the adhesive. Care must be taken to ensure that the flashing does not bridge where there is any elevation or directional change. Completely roll the flashing membrane against the substrate using a hand roller, J-roller or similar device applying firm pressure to the entire surface area to promote full contact.
3. All flashing shall be terminated as shown in standard SR Detail Drawings.
4. Stevens EP Metal flashing at perimeter shall be made and installed as per standard SR Detail Drawings.
5. Pipe flashings shall be installed in accordance with standard SR Detail Drawings. Remove existing flashings and sleeves. Do not flash to lead.
6. Expansion joints shall be installed in accordance with standard SR Detail Drawings.
7. Roof drains shall be installed in accordance with standard SR Detail Drawings. In reroofing, old drains must be cleaned or replaced as needed for clamping detail. All bolts must be properly secured to supply 100% continuous compression of the clamping ring. Remove old leads and packings. Field seams shall not be run through drains. Drain sleeves are not covered under warranty. Prefabricated sleeve insert with a clamping ring and backflow seal are acceptable.

**F. Ballast:** Ballast shall be sufficient to provide 100% coverage of membrane and otherwise satisfy normally authorized exposure criteria (*Reference 3.03 Ballast Requirements*).

**NOTE: Special care must be exercised during ballasting operation in order to not damage roofing system. Equipment (especially mechanical) used for applying ballast shall not**

**run over previously ballasted areas of membrane.**

1. Ballast must be loose laid and shall be river-washed stone or smooth paving blocks. Blocks with a rough surface or in high traffic areas require a protection sheet or board (*Consult Stevens Technical Review Dept. for specific approvals*).
2. Pavers must not exceed 60 lbs. each or exceed the compressive strength of the insulation board or substrate.

**G. Metal work:** Metal work other than Stevens Edge Metal Systems are not covered by Stevens Warranty.

1. Metal work shall be installed in a manner that prevents damage from buckling or wind.
2. All metal work must be sealed and waterproofed in an acceptable manner.

**H. Overnight seal/temporary water stop:**

Shall be made by a sealant method approved by Stevens. To protect the insulation from inclement weather at the end of a day's work, the membrane is extended beyond the insulation and set into the approved overnight seal material. Roofing applicator shall coordinate installation to ensure the system is made watertight at the end of each work day.

**I. Roof walkways:** When roof traffic is indicated (for example, to service rooftop units), a walkway over the membrane shall be made. Smooth concrete paver units meeting the minimum ballast weight requirements specified herein must be used. Install a slip sheet of medium weight (4 oz. or heavier), nonwoven polyester fabric between the pavers and the membrane in walkway areas.

### 3.03 Ballast requirements

**NOTE:** For open and/or seacoast application, ASCE Exposure C and D (*Reference Table 2, ASCE Exposure Classification Chart*) and buildings with large wall openings such as hangar doors, truck docks or canopies, contact Stevens Technical Review Dept.

**A. For buildings up to 30 ft. high:**

1. 3/4- to 1 1/2-in. round washed stone shall be used.
2. 10 pounds per sq. ft. minimum weight shall be applied.
3. A minimum 2-in. high gravel stop shall be installed.
4. Non-interlocking paver blocks are acceptable.

**B. For buildings over 30 ft. to 50 ft. high:**

1. 3/4- to 1 1/2-in. round washed stone shall be used.
2. 13 pounds per sq. ft. minimum shall be applied.
3. A minimum 12-in.-high continuous parapet wall is required.
4. Only interlock pavers are acceptable.

**C. For buildings over 50 ft. to 100 ft. high:**

1. Nominal 2 1/2-in. round washed stone shall be used. (*Reference ASTM D-448 sizes 20 or 24 gradation*).
2. 17 pounds per sq. ft. minimum shall be applied.
3. A minimum 36-in. high continuous parapet wall is required.
4. Only interlock pavers are acceptable.

**D. For buildings over 100 ft. high:**

1. Only interlocked paver systems will be considered (*Reference Stevens EP Paver Ballasted Specification*).
2. Contact Stevens Technical Review Dept. in all cases.

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## Table 2 - ASCE Exposure Classification

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### ASCE Exposure Classifications Defined

*ASCE (American Society of Civil Engineers) has defined the roughness of the terrain into four “ground roughness” categories, or “exposures”.*

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<b>Exposure A</b>	This classification applies to large city centers with at least 50 percent of the buildings having a height in excess of 70 feet (21.3 m). Use of this exposure category shall be limited to those areas for which representative terrain prevails in the upwind direction for a distance of at least one-half mile (0.8 km) or 10 times the height of the building or structure, whichever is greater. Possible channeling effects or increased velocity pressures due to the building or structure being located in the wake of adjacent buildings shall be taken into account.
<b>Exposure B</b>	Urban and suburban areas, wooded areas, or other terrain with numerous closely spaced obstructions having the size of a single-family dwelling or larger. Use of this exposure category shall be limited to those areas for which representative terrain prevails in the upwind direction for a distance of at least 1,500 feet (460 m) or 10 times the height of the building or structure, whichever is greater.
<b>Exposure C</b>	Open terrain with scattered obstructions having heights generally less than 30 feet (9.1 m). This category includes flat, open country and grasslands.
<b>Exposure D</b>	Flat, unobstructed areas exposed to wind flowing over open water for a distance of at least one mile (1.61 km). This exposure shall apply only to those buildings and other structures exposed to the wind coming from over the water. Exposure D extends inland from the shoreline a distance of 1,500 feet (460 m) or 10 times the height of the building or structure, whichever is greater.

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# STEVENS ROOFING SYSTEMS FASTENER SELECTION GUIDE

APPENDIX A



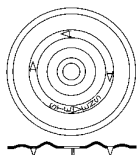
**PRODUCT DESCRIPTION:**  
Stevens #14 All-Purpose Fastener

All-purpose fastener for membrane and insulation attachment. Use with 2-inch (50-mm) BMSP or Hex Insulation Plate.

**SIZE AVAILABLE:**  
1¼, 2, 3, 4, 5-8-inch (30, 50, 75, 100, 125 - 200 - mm) in 1-inch (25-mm) increments and 10 and 12-inch (250 and 300-mm).

**DECK TYPE:**  
Structural concrete (pre-drilling required), wood and 18 to 26 (1.3 - .55-mm) gauge steel.

**PACKAGING:**  
1¼ - 6-inch (30 - 150-mm): 1000/bucket  
7, 8, 10, 12-inch (175, 200, 250, 300-mm): 500/bucket



**PRODUCT DESCRIPTION:**  
Stevens 2-in. (50 mm) Barbed Metal Seam Plates (for membrane attachment)

2-inch (50-mm) Galvalume® coated steel barbed seam plate for use with Stevens #14-10 fasteners or Stevens CD-10 concrete fasteners.

**SIZE AVAILABLE:**  
2-inch (50-mm) round barbed

**DECK TYPE:**  
NA

**PACKAGING:**  
1,000/bucket



**PRODUCT DESCRIPTION:**  
Stevens #12 Insulation Fastener

General purpose fastener for insulation attachment. Use with Hex Insulation Plate.

**SIZE AVAILABLE:**  
1<sup>5</sup>/<sub>8</sub>, 2¼, 2<sup>7</sup>/<sub>8</sub>, 3¼, 3¾, 4½, (41, 57, 73, 85, 95, 114-mm) 5 - 8-inch (125 - 200-mm) in 1-inch (25-mm) increments

**DECK TYPE:**  
Wood and 18 to 26 (1.3 - .55-mm) gauge steel

**PACKAGING**  
1<sup>5</sup>/<sub>8</sub> - 6-inch (41 - 150-mm): 1000/bucket  
7 and 8-inch (175 and 200-mm): 500/bucket



**PRODUCT DESCRIPTION:**  
Stevens Hex Insulation

2<sup>7</sup>/<sub>8</sub>-inch (73-mm) Hex-shaped Galvalume coated steel insulation plate for use with Stevens #12, #14 or Stevens CD-10 concrete fasteners.

**SIZE AVAILABLE:**  
2<sup>7</sup>/<sub>8</sub>-inch (73-mm) diameter

**DECK TYPE:**  
NA

**PACKAGING**  
1000/box



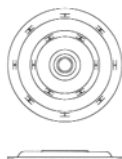
**PRODUCT DESCRIPTION:**  
Stevens Maxfast Fasteners

A large diameter head fastener for membrane attachment. Use with Maxfast Plate only.

**SIZE AVAILABLE:**  
2 - 8-inch(50 - 200-mm) in 1-inch (25-mm) increments

**DECK TYPE:**  
FM approved minimum 22 gauge steel\* [\*Test drill to check for installability on 18 and 20 (1.3 - 2.5-mm) gauge steel decks prior to committing to a project].

**PACKAGING:**  
2 and 3-inch (50 and 75-mm): 1000/bucket  
4 - 6-inch (100 - 150-mm): 500/bucket  
7 and 8-inch (175 and 200-mm): 250/bucket



**PRODUCT DESCRIPTION:**  
Stevens Maxfast Plate

A 3-inch (76-mm) diameter plate for use only with the Stevens Maxfast Fastener for membrane attachment.

**SIZE AVAILABLE:**  
3-inch (76-mm) diameter

**DECK TYPE:**  
NA

**PACKAGING:**  
500/bucket



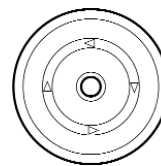
**PRODUCT DESCRIPTION:**  
Stevens Purlin Fasteners

A roofing fastener for membrane attachment to structural steel purlins in standing seam metal roof retrofit applications.

**SIZE AVAILABLE:**  
Overall Length: 3¾, 4¾, 5¾, 7 and 8-inch (95, 120, 146, 178 and 200-mm)  
Note: Usable length is ¾-inch (19-mm) less than overall length to allow the screw to quickly drill thru the purlin before the threads engage.

**DECK TYPE:**  
18-12 (1.3 - 2.5-mm) gauge steel

**PACKAGING:**  
500/box



**PRODUCT DESCRIPTION:**  
Stevens 2" Purlin Plate

A 2-inch (50-mm)diameter barbed metal seam plate designed to accommodate the head of the Stevens Purlin fastener. Use of other Stevens Plates may be necessary depending on project requirements.\*\*

**SIZE AVAILABLE:**  
2-inches (50-mm)

**DECK TYPE:**  
NA

**PACKAGING:**  
1000/box



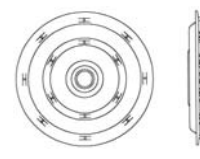
**PRODUCT DESCRIPTION:**  
Stevens DeckGrip Fastener

#15 fastener for membrane and insulation attachment. Used for Stevens EP and EV membrane

**SIZE AVAILABLE:**  
1¼, 2, -8, 10, 12, 14 and 16-inch (30, 50 - 200, 250, 300, 355 and 406-mm )

**DECK TYPE:**  
Structural concrete (pre-drilling required), wood and 18 to 26 (1.3 - .55-mm) gauge steel.

**PACKAGING:**  
1¼ (30-mm) 2, -5 -inch (50 -125-mm): 1000/box  
6, 7, 8, 10, 12, 14-inch (150, 175, 200 250, 300, 355-mm): 500/box and 16-inch (406-mm)250/box



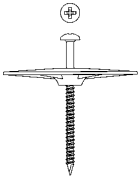
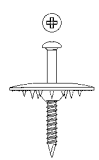
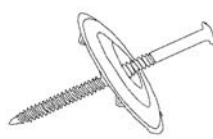
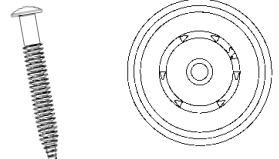



**PRODUCT DESCRIPTION:**  
Stevens DeckGrip Plate

Galvalume steel seam plate featuring a unique patented "Eye Hook" design. Stevens DeckGrip Reel-Fast Collated Seam Plates for easy installation. Spaced 6-in.(150 mm) or 12-in. (300 mm) o.c. (see separate datasheet)

**SIZE AVAILABLE:**  
2 3/8-inch (60-mm)

**DECK TYPE:**  
NA

**PACKAGING:**  
1000/bucket

			
<p><b>PRODUCT DESCRIPTION:</b> Stevens PIF (Preassembled insulation plate &amp; fastener)</p> <p>Preassembled #12 (black) fastener with 3-inch (75-mm) (blue) locking plate for insulation attachment.</p> <p><b>SIZE AVAILABLE:</b> 2¼, 2⅞, 4½, 5 - 8-inch (57, 73, 114, 127 - 200-mm) in 1-inch (25-mm) increments plus 10 and 12-inch (250 and 300 -mm). Other lengths available on special order.</p> <p><b>DECK TYPE:</b> Wood and 18 to 26 (1.3 -.55 -mm) gauge steel.</p> <p><b>PACKAGING</b> 2¼ - 8-inch (57 - 200-mm): 250/box 10-inch (250-mm) and longer: 200/box</p>	<p><b>PRODUCT DESCRIPTION:</b> Stevens ASAP (Preassembled membrane seam plate &amp; fastener)</p> <p>All-purpose #14 fastener pre-assembled with 2-inch (50-mm) (gray) nylon locking plate for membrane attachment.</p> <p><b>SIZE AVAILABLE:</b> 2 - 8-inch (50 - 200-mm) in 1-inch (25 -mm) increments plus 10, 12, and 14-inch (250, 300, 355-mm) and other lengths available on special order.</p> <p><b>DECK TYPE:</b> Structural concrete (pre-drilling required), wood and 18 to 26 gauge (1.3 - .55-mm ) steel.</p> <p><b>PACKAGING:</b> 2 and 3-inch (50 and 75-mm): 500/per box; 4-inch (100-mm): 450/box; 5-inch (125-mm) 400/box; 6-inch (150-mm): 350/box; 7 and 8-inch (175 and 200-mm): 300/box; 10 - 12-inch (250 and 300-mm): 200/box; 14-inch (355-mm): 150/box</p>	<p><b>PRODUCT DESCRIPTION:</b> Stevens Preassembled DeckGrip</p> <p>Preassembled membrane seam plate &amp; fastener</p> <p><b>SIZE AVAILABLE:</b> 2 - 8, 10, and 12-inch (50 - 200, 250 and 300-mm)</p> <p><b>DECK TYPE:</b> Structural concrete (pre-drilling required), wood and 18 to 26 gauge (1.3 - .55-mm ) steel.</p> <p><b>PACKAGING:</b> 2 and 3-inch (50 and 75-mm): 500/box 4 - 8-inch (100 - 200-mm) 250/box 10,12-inch (250, 300-mm) 125/box</p>	<p><b>PRODUCT DESCRIPTION:</b> Stevens SW Fastener and Plate Kits</p> <p>A "Superior Withdrawal" fastener for membrane attachment with 23/8-inch (60-mm) SW Barbed Metal Seam Plate.</p> <p><b>SIZE AVAILABLE:</b> 2 - 8-inch(50 - 200-mm) in 1-inch (25-mm) increments</p> <p><b>DECK TYPE:</b> FM Approved minimum 22 (.85-mm ) gauge steel* (*Test drill to check for installability on 20 (1.0-mm) gauge steel decks prior to committing to a project).</p> <p><b>PACKAGING:</b> 2 - 8-inch (50 - 200-mm) 250 fasteners and plates/bucket</p>
			
<p><b>PRODUCT DESCRIPTION:</b> Stevens CD-10 Concrete Fastener</p> <p>Non-threaded hammer-in (spike type) fastener for membrane and insulation attachment.</p> <p><b>SIZE AVAILABLE:</b> 2 - 4-inch (50 - 100-mm) in ½-inch (13-mm) increments, 4 - 10-inch (100-250-mm) in 1-inch (25-mm) increments, and 12-inch (300 -mm)</p> <p><b>DECK TYPE:</b> Structural concrete</p> <p><b>PACKAGING:</b> 2 - 8-inch (50 - 200-mm): 500/box 9-inch (228-mm) and longer: 250/box</p>	<p><b>PRODUCT DESCRIPTION:</b> Stevens Masonry Anchor</p> <p>Hammer-in-type fastener for securing termination bar.</p> <p><b>SIZE AVAILABLE:</b> 1/4-inch (6-mm) diameter x 1¼-inch (30-mm) length</p> <p><b>FOR USE IN:</b> Concrete and masonry</p> <p><b>PACKAGING:</b> 1,000/box</p>	<p><b>PRODUCT DESCRIPTION:</b> Stevens Termination Bar</p> <p>Aluminum bar for use in membrane termination. Refer to specific SR details.</p> <p><b>SIZE AVAILABLE:</b> 1-inch (25-mm) wide, 10-ft. (3-m) long 6-inch (150-mm) o/c slotted, punched</p> <p><b>DECK TYPE:</b> N/A</p> <p><b>PACKAGING:</b> 500-ft. (152-m)/tube 50 pcs,10-ft. (3-m) long</p>	



## Appendix MA-B

(page 1 of 2)

### STEVENS Approved Insulation List and Fastening Rates (Chart 5) for Mechanically Attached, Ballasted and VRS System Types

#### Introduction

This is a listing of insulation and cover board products acceptable for use with the Stevens Mechanically Attached Roofing System. Each listing shows specific manufacturer and product names, indicates which products are approved for retrofit applications and which are eligible for Stevens "Total System" Warranty coverage. In addition, fastening recommendations for each product type are shown. Please note the variations in required insulation pre-securement and/or cover board requirements as it relates to membrane color, insulation type and thickness.

It is not within the scope of this chart to provide information relating to building code compliance, or specific Factory Mutual Global or Underwriters Laboratories, Inc. approvals. FMG, UL and/or building code requirements for insulation type, thermal barrier requirements, minimum/maximum insulation thickness and product pre-securement rates may differ from the Stevens requirements shown herein. Refer to the current edition of the FMG Approval Guide, the UL Roofing Materials and Systems Directory and/or the UL Fire Resistance Directory for complete information, or contact the Stevens Technical Review Dept. Stevens recommends that the building dept. be consulted ensure compliance with local requirements.

#### General Recommendations

- 1) Refer to the product manufacturer's literature to confirm minimum allowable thickness required to span steel deck flutes, etc.
- 2) Adjacent insulation/cover boards shall be installed as closely as possible with no gaps or offsets greater than 1/4 inch.
- 3) Since many insulation systems provide taper to 1/2 inch thickness only, a tapered edging of Stevens approved insulation is recommended to be installed at all such transitions on Mechanically Attached, VRS (Vented Roofing System) and Ballasted Roofing Systems.
- 4) Approved insulation products shall be installed with the longest dimension of the board perpendicular to the direction of mechanically secured membrane lap seams whenever possible. Insulation end joints shall be staggered.
- 5) Insulation pre-securement fasteners/plates shall be installed at the rates shown herein and located on each board as shown in Stevens detail drawings SR-622A, 622B and 622C.
- 6) For applicable substrates, Stevens permits insulation boards to be adhered using a Stevens-supplied insulation adhesive, hot steep asphalt (ASTM D312, type III and IV) and some commercial insulation adhesive products. The insulation manufacturer, adhesive manufacturer and Stevens Technical Services must specifically approve such applications.
- 7) For Ballasted Systems (stone, paver), insulation boards shall be loose laid as outlined in the Stevens Guide Specifications. The insulation may be loose laid for VRS (Vented Roofing System) applications provided the boards are overlaid with a minimum 1/2 inch thick layer of moisture-resistant gypsum board.
- 8) Consult the Stevens Technical Review Department at (877)788-8324 if the insulation manufacturer's current installation/securement instructions conflict with information published herein.

#### For Products Not Listed Herein

In the event that you wish to use an insulation product that does not appear on the Stevens Approved Insulation list, please contact the Stevens Technical Review Dept. at (877)788-8324 for recommendations prior to commencement of the project.

**STEVENS Approved Insulation List and Fastening Rates (Chart 5)**  
for Mechanically Attached, Ballasted and VRS System Types

Insulation Type	Approved Manufacturers	Approved Product Name	Approved for Retrofit Applications	Approved for Stevens "Total System" Warranty	Insulation Pre-Securement for Mechanically Attached Systems		
					Stevens EV colors, EP colors or black EP	Stevens white EV, EP and Hypalon	
Expanded Polystyrene (EPS)	Insulfoam (Premier Industries)	Type VIII (1.25 pcf)	Yes (see note 1)	Yes	Overlayment Required (see note 2)	Overlayment Required (see note 3)	
		Type VIII (1.25 pcf) with "Secure-Ply" overlay					
		Type II (1.50 pcf)					
	Generic	R-TECH (fanfold) 1/2-in., Type VIII (1.25 pcf)	Recover Only (see note 1)	Yes (see note 1)	N/A	15 per 4'x 50' area	15 per 4'x 50' area
		Type VIII (1.25 pcf)					
		Type II (1.50 pcf)					
Extruded Polystyrene	Dow Chemical Company	Styrofoam™	Yes (see note 1)	Yes	26 per 4'x 50' area	26 per 4'x 50' area	
		Recovermate™ CR (fanfold)	Recover Only (see note 1)				
		Recovermate™			8 per 4'x 8' bd. (see note 6)		
	Owens-Corning Building Products	Durapink®	4 per 4'x 8' bd.				
	Paciv Building Products	Foamular® 250, 404			Yes (see note 1)	Overlayment Required (see note 2)	6 per 4'x 8' bd.
		PB-6® (fanfold)	Recover Only (see note 1)		26 per 4'x 50' area		
Gypsum Board	Georgia-Pacific Corp.	1/4" Dens-Deck®	(see note 4)	Yes		5 per 4'x 8' bd.	5 per 4'x 8' bd.
		1/2" Dens-Deck®	Yes				
	Generic	Moisture Resistant	N/A	Yes	Overlayment Required for Mech. Attached systems (see note 5). Approved for VRS applications.		
	USG	1/4" Securock®	(see note 4)		5 per 4'x 8' bd.	5 per 4'x 8' bd.	
Perlite	Generic	Various	N/A	N/A	Overlayment Required (see note 5)		
					STEVENS Roofing Systems	Iso 2000	Yes
Iso 2000 Tapered							
Iso 3000							
Polyisocyanurate	Atlas Roofing Corporation	AC Foam II®, AC Foam III®	Yes	Yes	5 per 4'x 8' bd. 4 per 4'x4' bd.	5 per 4'x 8' bd. 4 per 4'x4' bd.	
		Recover Board®	Yes (recover only)				
	Dow Chemical Company	Hy-Therm AP®	Yes	Yes	5 per 4'x 8' bd. 4 per 4'x4' bd.	5 per 4'x 8' bd. 4 per 4'x4' bd.	
		Hy-Therm Composite®					
	Dyplast Products, LLC	dpFOAM II, III™	Yes	N/A	5 per 4'x 8' bd. 4 per 4'x4' bd.	5 per 4'x 8' bd. 4 per 4'x4' bd.	
	Firestone Building Products	ISO 95+®, ISO 300					
	Hunter Panels, LLC	H-Shield	Yes	Yes	5 per 4'x 8' bd. 4 per 4'x4' bd.	5 per 4'x 8' bd. 4 per 4'x4' bd.	
	Johns Manville Corp.	ENRGY™ 3					
		Rmax, Inc.	JM ISO I®	Yes	N/A	5 per 4'x 8' bd. 4 per 4'x4' bd.	5 per 4'x 8' bd. 4 per 4'x4' bd.
	Multi-Max® FA						
Wood Fiberboard	Georgia-Pacific Corp.	High Density Roof Fiberboard	Yes	N/A	6 per 4'x 8' bd. 4 per 4'x4' bd.	6 per 4'x 8' bd. 4 per 4'x4' bd.	
	IKO	Armourdeck					
	Knight-Celotex	Structodek™					
	Temple Inland	HD-1, HD-6					Yes

Notes:

1. A separation sheet/layer may be required when using a polystyrene product directly over coal tar pitch B.U.R. or PVC-based roof systems. Consult the insulation manufacturer for specific requirements.
2. Stevens requires this product to be overlaid with an approved polyisocyanurate, wood fiberboard, or Dens-Deck™ insulation/cover board when using with black or colored Stevens Membrane.
3. Due to the lower compressive strength of Type II (1.25 pcf nominal density) expanded polystyrene (EPS), Stevens requires this product to be overlaid with an approved polyisocyanurate, wood fiberboard, or Dens-Deck™ insulation/cover board for Mechanically Attached, Fully Adhered and some VRS Roofing Systems. Type I (1.0 pcf nominal density) EPS is acceptable for use under ballasted systems only.
4. This product is not approved as a recovery layer directly over gravel-surfaced B.U.R. roof systems. It is approved for use over existing single-ply and smooth or mineral surfaced roof systems.
5. Stevens considers this product a "barrier board", used as an underlayment in insulation assemblies to meet specific fire ratings. Stevens requires barrier boards to be overlaid with an approved insulation or cover board.
6. Dow "Recovermate™" and Owens-Corning "Durapink®" products may have additional installation requirements/restrictions when used directly under black or dark colored membrane. Consult the product manufacturer and/or the Stevens Technical Department for specific requirements.