

# STEVENS ROOFING SYSTEMS VENTED ROOF SYSTEMS (VRS) STEVENS EP™

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# CSI Division 7 Guide Specifications

# VENTED ROOF SYSTEM

# STEVENS EP™

## PART 1 - GENERAL

### 1.01 Description

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

#### Special Conditions

**NOTICE:** No installation will be accepted for Stevens VRS Warranty unless the complete Request for Warranty (RFW) has been received and approved by Stevens prior to job start.

1. This specification is intended to be applied to building roofs that have deck structures meeting guidelines herein and have no abnormally severe or unknown environmental exposures, e.g. coastal winds or certain chemicals, except as specifically authorized herein (*Reference Table 2, ASCE Exposure Chart*).
2. All applications require review by Stevens Roofing Systems Technical Review Dept. before any specification is valid.

**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 Stevens authorized roofing applicator. Applicator must have written certification from Stevens for approval to install the VRS System.

- 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 & Systems Directory* for specific assemblies.

- C. Inspection:** Job start training by a Stevens Technical Representative is mandatory for ALL VRS installations. Upon completion of the installation, an inspection shall be performed by a representative of Stevens to ascertain that the roofing membrane system has been installed according to Stevens approved specifications and details. Upon approval of the project, a Warranty shall be written.

- D. Changes:** Should there be deviations or changes from this specification without written approval of Stevens or the submitted construction conditions are inaccurate, 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. VRS Authorized Applicators must submit a roof drawing indicating which details will be employed in the project as well as all accurate existing construction conditions. These drawings shall be approved by Stevens prior to the start of work. These must include: exact deck construction, outline and size of the roof, location and type of penetrations, perimeter (including any overhang or soffit conditions) and penetration flashing detail references as well as a layout of any substantial above deck piping or

mechanical screens, and a copy of any non-SR details to be used. Details which do not conform to Stevens standard SR Detail Drawings must be shown as to their anticipated construction.

### 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 manufacturer's requirements.

### 1.05 Precautions

- A. Adhesives, solvents, and caulks as indicated are extremely flammable and/or toxic. Follow precautions indicated on containers and 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, plus insulation board fastened to the specific manufacturers recommendations.
- C. Fasteners should be installed with a depth-sensing screw gun to prevent overdriving or underdriving. Insulation may be loose laid with a minimum 1/2-in. thick moisture resistant gypsum board overlayment. If the job specification requires insulation attachment, an approved insulation board shall be mechanically attached with Stevens fasteners and approved insulation plates or bonded to the structural concrete deck with a Stevens-supplied insulation adhesive.
- D. Block off or shut down positive pressure building ventilation systems during application to prevent sheet from billowing during application.
- E. Consideration should be given in the project design to potential safety problems that can precipitate from the smooth surface characteristic of the Stevens EP sheet. The membrane surface becomes slippery when wet. If access to roof is required, walkway surfaces are highly recommended. In northern climates, sliding snow could create a hazard below and adjacent to the perimeter if a retarding system is not installed on roofs with slopes greater than 2-in. per foot.
- 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 onto 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. For buildings with 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.

### 1.06 Warranty

- A. A Stevens representative shall inspect the installation for compliance with applicable Stevens specifications upon completion of the roofing system.
- B. Upon acceptance of the roofing system installation, a Stevens standard or Total System Warranty will be issued for a five (5), ten (10) or fifteen (15) year period covering wind damage up to 60 mph.
- 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 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*. (Fac-

**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, ASTM D-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.

tory fabricated 10-ft. and 12-ft. widths are also available for .045 and .060 thick materials only. Contact Stevens Technical Review Dept. for more information). Stevens EP membrane is available in White, Light Slate Gray, Pewter, Buckskin, Terra Cotta, Patina, Dark Ivy Green or 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 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. Flashing:** Flashing shall be .045-in. thick membrane for walls and curbs regardless of roof cover sheet thickness. Unsupported .055-in.-thick, Stevens EP membrane shall be supplied for field-fabricated vent stacks, pipes, drains, and corners. Stevens EP-Clad Metal may be used for gravel stops or drip edges.

**C. Adhesives, sealants, primers and caulks:**

**1. Stevens EP (TPO) Bonding Adhesive:**

Stevens EP (TPO) Bonding Adhesive is designed for bonding all 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 or Stevens EP-Fleece membrane.

**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, as an exterior grade caulk for metalwork.

**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.

**D. Mechanical fasteners:** All air-seal terminations shall be made per Stevens approved details utilizing fasteners supplied by Stevens (*Reference Appendix A, Stevens Fastener Selection Guide*). When insulation is to be mechanically attached, secure as directed in *Appendix MA-B, Stevens Approved Insulation List and Fastening Rates*.

**E. Termination bar:** Stevens Termination Bar fastened 6-in. o.c. is the only authorized product.

**F. Stevens Edge Metal Systems:** Stevens Edge Metal Systems must be installed per standard SR Detail Drawings.

**G. Roof walkways:** When roof traffic is indicated (for example to service rooftop units),

a walkway over the membrane shall be made. Stevens EP walkway roll heat welded to the membrane is recommended.

#### H. Prefabricated Stevens EP Pipe

**Boots:** Are provided as an alternative to .055-in. unsupported flashing for Stevens VRS Vents, vent stacks and pipes 1-in. to 6-in.

#### I. Prefabricated Stevens EP Corners:

Are provided as an alternative to .055-in. unsupported flashing for use at outside and inside corners.

**J. Stevens EP Flashing Tape:** 6-in. wide x 70-mils thick, packaged 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). Stevens EP Flashing Tape eliminates the need for Stevens EP (TPO) Bonding Adhesive and Stevens All-Purpose Sealant when completing edge flashings. Surfaces must be prepared with Stevens Tape Primer prior to Stevens EP Flashing Tape application.

**K. Stevens VRS Air Valves:** Shall be supplied by Stevens.

## 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 one inch (1-in.) in twelve inches (12-in.), for slopes greater than one inch (1-in.) in twelve (12-in.) contact Stevens Technical Review Dept. for acceptability.

**B. Concrete deck:** Surface shall be a monolithic structural or lightweight concrete poured over structural concrete (see 3.01.C) poured tightly at penetrations and perimeters which are dry, level, clean, smooth, free of structural cracking or sharp edges, and suitable for accep-

tance of Stevens EP membrane. Concrete deck must be dry, fully cured, and prepared smooth with dust removed. The membrane shall have a fastened expansion joint detail (as per SRV Detail Drawings) where deck joints exist or when crossing a building expansion joint.

**NOTE:** Any cracks or other breaches in the roof deck must be sealed to prevent air infiltration into the system. Consult Stevens for acceptable sealing techniques.

**C. All other decks:** Metal, wood, plank, and cementitious wood fiber shall be overlaid with poured in place structural or an approved lightweight concrete in good condition. Some lightweight concrete products may not be suitable. Contact Stevens Technical Review Dept. for acceptable products.

**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:** A treated wood nailer is recommended. Effective perimeter attachment must be achieved per standard SR detail Drawings and/or as specified by architect/consultant.

**3. All construction:** Nailer should 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:** Nail 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 Air Seal Detail 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 substrates.

**H. New construction or reroof with complete tearoffs of flashings:** The applicator is responsible for determining the suitability of the substrate 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 insulation types, such as polystyrene, are not compatible with coal tar pitch. Contact manufacturer for recommendations. Certain polystyrene insulations are not suitable for use directly under certain colors of Stevens EP membrane and require an overlayment ([Reference Appendix MA-B, Approved Insulation List & 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. Approved insulation:** May be loose laid with a minimum 1/2 in. thick moisture resistant gypsum board overlayment. If the job specification requires insulation attachment, an approved insulation board shall be mechanically attached with Stevens insulation fasteners and insulation plates ([reference section 2.03.D](#)) or bonded to the structural concrete deck with a Stevens-supplied insulation adhesive. Boards will be butted as close as possible, and voids greater than 1/4- in. shall be filled.

#### B. Membrane installation

- 1. Air seal:** The Stevens EP membrane shall be sealed and mechanically attached with appropriate Stevens fastener at all perimeters and through-deck penetrations ([Reference specific SRV Air Seal Detail Drawings](#)).
  - 2.** At all perimeters that are to receive a gravel stop or metal edging after installing approved air seal, the Stevens EP membrane must be brought over the outside edge and terminated 12-in. o.c. ([Reference specific SRV Detail Drawings](#)). All field areas of membrane must overlap adjacent sheet by minimum 2-in. and be hot-air welded as in section 3.02.C.
  - 3.** Stevens VRS Valves are to be installed as per Stevens detail SRV-1E at pre-specified locations determined by Stevens Technical Review Dept.
- C. Lap splice:** Membrane shall be overlapped 2-in. and hot-air welded without any contaminants (adhesive, dirt, debris, etc.) in the seam. ([Reference SR-600 Detail Drawing](#)).
- 1. Hot-air welding:** An automatic hot-air welder and hand-held welder which are functionally in top condition are required 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 (i.e. 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 there should be 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 done for the first seam of the day, first seam after the robot welder has 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 and are independent of most air seal termina-

tions. Membrane will be fastened by use of specified Stevens approved air-seal detail.

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

**2. Perimeter or curb:** Membrane must be mechanically attached 6-in. o.c. with a Stevens approved air-seal detail to the deck at all perimeters and at all through-deck penetrations.

**E. Flashing:** Perimeters, curbs, vents, expansion joints, drains, and other details shall be flashed as shown in 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 EP membrane overlaps itself.**

**2.** Stevens EP (TPO) Bonding Adhesive shall be allowed to dry until tacky and 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 pressure to the entire surface area.

**3.** All flashing shall be mechanically fastened at the top, under or through appropriate counterflashing with approved fasteners 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. However, a prefabricated sleeve insert with clamping ring and backflow seal are acceptable.

**F. 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.

**G. 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.

**H. Roof walkways:** When regular roof traffic is indicated (for example, to service rooftop units), Stevens EP Walkway Roll is recommended to be installed over the membrane. To install Stevens EP Walkway roll:

**Installation:**

For dirty and/or weathered membrane, start with #1 below. For clean fresh membrane, start with #4 below.

1. Stevens EP membrane must be clean and dry. Remove any visible dirt and debris with a clean rag and water. For a heavily contaminated surface, scrubbing with a detergent cleaner (i.e. Fantastik® or 409®) followed by a water rinse may be necessary.
2. With a clean scrub pad saturated with Stevens EP Seam Cleaner, aggressively agitate the seaming area of the roof membrane surface. With a clean white rag, follow with a final one-swipe pass being careful not to redeposit any contaminants back onto the cleansed sheet surface.
3. Allow Stevens EP Seam Cleaner to completely flash off (i.e. membrane should be completely dry).
4. Position walkway roll and cut to desired length. Whenever possible, walkway shall not cover seams. When installed adjacent to a seam, the walkway should be kept a

minimum of 2-in. from the edge of the seam on the bottom sheet of the completed lap and a minimum of 6-in. from the edge of the seam when located on the top sheet of a completed lap.

When covering seams is unavoidable, the lap seam should be completed per Stevens Specifications and thoroughly probed with any deficiencies repaired prior to walkway installation.

In circumstances where drainage around the walkway is a concern, shorter walkway lengths spaced with a 2-in. gap may be desired.

5. Weld perimeter of walkway to the membrane following standard welding procedures. Periodic 1- to 2-in. weep breaks in the weld are required on the low slope edge of the walkway to prevent the accumulation of water under the pad.

### 3.03 Vented roof system variations for severe exposures.

**NOTE:** For seacoast application, ASCE Exposure D, ([See Table 2, ASCE Exposure Classification Chart](#)) and buildings with large wall openings such as hangar doors, truck docks, or buildings with positive pressure, contact Stevens Technical Review Dept. for suitability of specification.

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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



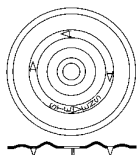
**PRODUCT DESCRIPTION:**  
Stevens #14 All-Purpose Fastener

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



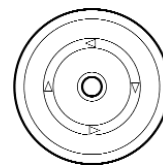
**PRODUCT DESCRIPTION:**  
Stevens Purlin Fasteners

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



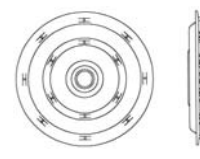
**PRODUCT DESCRIPTION:**  
Stevens DeckGrip Fastener

#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



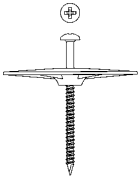
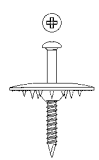
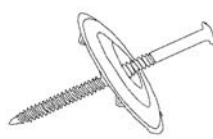
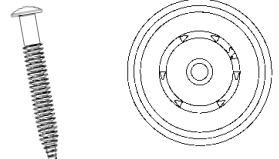



**PRODUCT DESCRIPTION:**  
Stevens DeckGrip Plate

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) 6 per 4'x 8' bd.		
		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)	15 per 4'x 50' area	15 per 4'x 50' area			
Type VIII (1.25 pcf)		Yes (see note 1)	N/A			Overlayment Required (see note 3) 6 per 4'x 8' bd.		
Type II (1.50 pcf)				4 per 4'x 8' bd.				
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)				8 per 4'x 8' bd. (see note 6)	6 per 4'x 8' bd.
		Recovermate™						
	Owens-Corning Building Products	Durapink®	Yes (see note 1)		6 per 4'x 8' bd.			
		Foamular® 250, 404						
Paciv Building Products	PB-6® (fanfold)	Recover Only (see note 1)	26 per 4'x 50' area	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	N/A	Overlayment Required for Mech. Attached systems (see note 5). Approved for VRS applications.			
USG	USG	1/4" Securock®	(see note 4)	Yes	5 per 4'x 8' bd.	5 per 4'x 8' bd.		
		1/2" Securock®	Yes					
Perlite	Generic	Various	N/A	N/A	Overlayment Required (see note 5)			
Polyisocyanurate	STEVENS Roofing Systems	Iso 2000	Yes	Yes (see "Warranty Fee Table" for applicable fee discounts)	5 per 4'x 8' bd. 4 per 4'x4' bd.	5 per 4'x 8' bd. 4 per 4'x4' bd.		
		Iso 2000 Tapered						
		Iso 3000						
		Recover Board					Yes (recover only)	
	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							
Johns Manville Corp.	ENRGY™ 3							
	JM ISO I®							
Rmax, Inc.	Multi-Max® FA	Yes (recover only)	Yes	6 per 4'x 8' bd.	6 per 4'x 8' bd.			
	Recover Board							
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.