



SHORT FORM SPEC FULLY ADHERED ROOFING SYSTEM

November 2007

This SHORT FORM SPEC is a brief outline of Versico's VersiWeld Fully Adhered Roofing System requirements and is intended for use as a submittal with a bid package. Specifiers and Versico Authorized Roofing Contractors must comply with the "Design Criteria" and "Application" sections of Versico's Specifications prior to design or bid.

PART I GENERAL

1.01 DESCRIPTION

This VersiWeld Adhered Roofing System incorporates maximum 12' wide, white, gray or tan 45, 60, 72 or 80-mil thick scrim-reinforced VersiWeld Thermoplastic Polyolefin (TPO) membrane. Versico Insulation is typically mechanically fastened to the roof deck with fasteners and plates or secured with FAST™ Adhesive, or VersiGrip® Insulation Adhesive and the membrane is fully adhered to the insulation with VersiWeld Bonding Adhesive. Adjoining sheets of membrane are overlapped approximately 2" and joined together with a minimum 1-1/2" wide hot air weld.

1.02 QUALITY ASSURANCE

- A. This roofing system must be installed by a Versico Authorized Contractor in compliance with shop drawings as approved by Versico. There must be no deviations made without the **PRIOR WRITTEN APPROVAL** of Versico.
- B. Upon completion of the installation, an inspection will be conducted by a Field Service Representative of Versico to ascertain the membrane roofing system has been installed according to Versico's published specifications and details applicable at the time of bid.
- C. This roofing system meets Underwriters Laboratories (UL) and Factory Mutual (FM) requirements. For specific code approvals achieved with this roofing system, refer to the VersiWeld Code Approval Guide, Factory Mutual Approval Guide or Underwriters Fire Resistance and roofing Materials and Systems Directories.

1.03 SUBMITTALS

- A. To ensure compliance with Versico's warranty requirements, the following projects should be sent to Versico for review prior to installation, preferably prior to bid.
 - 1. Projects where a wind speed warranty coverage greater than 55 mph peak gust wind speed is specified.
 - 2. Projects where the building height exceeds 250'.

- 3. Air pressurized buildings, canopies and buildings with large openings where the total wall opening exceeds 10% of the total wall area where openings are located.
- 4. Cold storage buildings and freezer facilities.
- 5. Projects where the membrane is expected to come in direct contact with petroleum based products or other chemicals.

- B. Along with the project submittals (shop drawing and Application for Job Approval Copy-A), when fastener pullout values do not meet the requirements listed in the Versico specification, test results with the appropriate Versico fastener must be submitted by the roofing contractor for review.
- C. For all projects (prior to project inspection by Versico) a final shop drawing must be approved and assigned a number by Versico.

1.04 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Deliver materials to the job site in the original, unopened containers labeled with the manufacturer's name, brand name and installation instructions.
- B. Store VersiWeld membrane in original undisturbed plastic wrap.
- C. Job site storage temperatures in excess of 90° F may affect shelf life of curable materials (i.e., adhesives and sealants).
- D. When liquid adhesives and sealants are exposed to lower temperatures, restore to a minimum of 60° F before use.
- E. Do not store adhesive containers with opened lids due to loss of solvent which will occur from flash off.
- F. Insulation and underlayment must be stored so it is kept dry and is protected from the elements. Store insulation on a skid and completely cover with a breathable material such as tarp or canvas. If the insulation is lightweight, it should be weighted to prevent possible wind damage.

1.05 JOB CONDITIONS

- A. There are no maximum slope restrictions for application of this roofing system. When the roof slope exceeds 5" per horizontal foot, use of an automatic welding machine may be more difficult. A hand held welder should be specified.
- B. Existing roofing material must be investigated by the specifier and all wet material must be removed.

- C. Existing phenolic insulation and sprayed-in-place urethane roofs must be removed prior to installation of this system.
- D. The use of a vapor retarder to protect insulation and reduce moisture accumulation within an insulated roofing assembly should be investigated by the specifier. Consult the latest publications by ASHRAE (American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc.) and NRCA (National Roofing Contractors Association).
- E. Coordination between trades is essential to avoid unnecessary rooftop traffic over sections of the roof and to prevent subsequent damage to the membrane system.

1.06 WARRANTY

All warranties are available for commercial projects only.

- A. A **5 or 10-year Membrane System Warranty** with a wind speed coverage of up to 55 mph is available for a charge.
- B. A **10 or 15-year Total System Warranty** is available for a charge on projects which utilize all components manufactured or marketed by Versico. These projects will receive a standard maximum peak gust wind speed coverage up to 55 miles per hour.

Roofing systems may be eligible for a Total System Warranty with a peak gust wind speed coverage greater than 55 mph. For criteria required to obtain such coverage, refer to the 10 or 15-year Extended Wind Speed Criteria Attachment in the VersiWeld Roofing System "Design Criteria" Specification.

- C. A **20-year Total System Warranty** is available for a charge for projects utilizing minimum 60-mil thick VersiWeld membrane and incorporating additional design enhancements as outlined in "Attachment IV", 20-Year Warranty Design Enhancements, in the VersiWeld Design Criteria Specification.

PART II PRODUCTS

2.01 GENERAL

The components of this roofing system are to be products of Versico or accepted by Versico as compatible. The installation, performance or integrity of products by others, **when selected by the specifier and accepted by Versico**, is not the responsibility of Versico and is **expressly disclaimed** by the Versico Warranty.

2.02 MEMBRANE

VersiWeld, white, gray or tan, reinforced 45, 60, 72 or 80-mil thick Thermoplastic Polyolefin (TPO) membrane is used for this roofing system. Membrane is available in widths of 12', 10' or 8' and lengths of 100'. For membrane physical properties, refer to page 4.

2.03 RELATED MATERIALS

VersiWeld Non-Reinforced or Reinforced Flashing, VersiWeld Bonding Adhesive, Cut Edge Sealant, Splice Cement, Water Cut-Off Mastic, PT-304 Sealant, Weathered Membrane Cleaner, Thermoplastic One Part Sealant, Heat Weldable Walkway Roll, TPO Inside/Outside Corners, TPO Molded Pipe Seals, Curb Wrap

Corners and TPO Molded Sealant Pockets.

PART III EXECUTION

3.01 GENERAL

- A. When feasible, begin the application at the highest point of the highest roof level and work to the lowest point to prevent moisture infiltration and to minimize construction traffic on completed sections. This will include completion of all flashings, terminations and daily seals.
- B. Follow criteria outlined in the "Design Criteria" section to prepare the roof deck or the existing substrate prior to application of the new roofing system.

3.02 ROOF DECK CRITERIA

- A. The proper substrate shall be provided by the building owner. The structure shall be sufficient to withstand normal construction loads and live loads.
- B. Defects in the roof deck must be reported and documented to the specifier, general contractor and building owner for assessment. The Versico Authorized Contractor shall not proceed with installation unless the defects are corrected.
- C. Acceptable decks and applicable Versico Fasteners:
 1. **Steel, 22 gauge or heavier** - Versico HPV or HPVX Fasteners are required; minimum pullout of 360 pounds per fastener.
 2. **Steel less than 22 gauge** - Versico HPV or HPVX Fasteners are required; minimum pullout of 300 pounds per fastener.
 3. **Structural Concrete, rated 3,000 psi or greater** - Versico CD-10 or MP-14-10 Fasteners are required; minimum pullout of 800 pounds per fastener.
 4. **Wood Plank or minimum 15/32" thick Plywood** - Versico HPV or HPVX Fasteners are required; minimum pullout of 360 pounds per fastener.
 5. **Oriented Strand Board (OSB), minimum 7/16" thick** - Versico HPV or HPVX Fasteners are required; minimum pullout of 250 pounds.
 6. **Gypsum and Cementitious Wood Fiber** - Versico NTB Fasteners are required; minimum pullout of 300 pounds per fastener into gypsum and 225 pounds per fastener into cementitious wood fiber.

3.03 SUBSTRATE PREPARATION

- A. On retrofit-recover projects, cut and remove wet insulation, as identified by the specifier, and fill all voids with new insulation so it is relatively flush with the existing surface.
- B. For all projects, substrate must be even without noticeable high spots or depressions, and must be free of accumulated water, ice or snow.
- C. Clear the substrate of debris and foreign material. Fresh bitumen based roof cement must be removed or concealed.

3.04 INSTALLATION

Refer to the applicable Material Safety Data Sheets and Technical Data Bulletins for cautions and warnings.

A. Insulation Attachment

1. Versico Insulation shall be mechanically attached to the roof deck at a minimum rate of 1 every 2 square feet except as follows.
 - a. When a single or top layer of **minimum 1-1/2" thick Versico Polyisocyanurate** Insulation is specified, Versico Insulation may be mechanically attached at the minimum rate of 1 every **3.2 square feet** (10 fasteners per 4' x 8' board). Refer to Detail VWA-27.4 for requirements.
 - b. When a single or top layer of **minimum 2" thick Versico Polyisocyanurate** Insulation is specified, Versico Insulation may be mechanically attached at the minimum rate of 1 every **4 square feet** (8 fasteners per 4' x 8' board). Refer to Detail VWA-27.2 for requirements.
2. When an approved oriented strand board (OSB) is specified as the membrane underlayment, it must be mechanically fastened to the roof deck with 17 fasteners per 4' x 8' board in accordance with Versico Detail VWA-27.3
3. Versico Insulation Fastening Plates, nominal 3" diameter, must be used with the appropriate Versico Fastener for insulation attachment.
4. When mechanical attachment of the insulation is not desired, an alternate insulation attachment method may be specified which incorporates the use of Versico FAST Adhesive, OlyBond 500, VersiGrip Adhesive or a solid mopping of hot asphalt.

B. Membrane Installation and Hot Air Welding

1. Sweep loose debris from the substrate.
2. Position VersiWeld Membrane over acceptable substrate and fold membrane back so half the underside is exposed.
3. Apply VersiWeld Bonding Adhesive to the exposed underside of the membrane and the corresponding substrate area with a plastic core medium nap paint roller at a coverage rate of approximately 60 square feet per gallon per finished surface (includes coverage on both membrane and substrate).
4. Allow adhesive to dry until tacky and roll coated membrane into coated substrate and avoid wrinkling.
5. Brush down the bonded section of membrane immediately with a soft bristle push broom.
6. Fold back the unbonded half of the sheet and repeat the

bonding procedure.

7. Install adjoining membrane sheets in the same manner, overlapping edges a minimum of 2" to provide for a minimum 1-1/2" hot air weld. It is recommended that all splices be shingled to avoid bucking of water.
8. Hot air weld the membrane sheets a minimum of 1-1/2" with an Automatic Hot Air Welding Machine.
9. Membrane that has been exposed to the elements for approximately 7 days must be prepared with Weathered Membrane Cleaner. Wipe the surface where Weathered Membrane Cleaner has been applied with a clean, dry Seam Wipe or other white rag to remove cleaner residue prior to hot air welding.

C. Additional Membrane Securement

The membrane must be secured at the perimeter of each roof level, roof section, expansion joint, curb, skylight, interior wall, penthouse, etc., at any angle change which exceeds 2" per horizontal foot and at all other penetrations in accordance with Versico's published details.

D. Membrane Flashing

1. Flash all walls and curbs with VersiWeld reinforced membrane. Non-Reinforced membrane shall be limited to inside and outside corners, field fabricated pipe seals, scuppers and Sealant Pockets where the use of pre-molded accessories are not practical. Terminate the flashing in accordance with an appropriate Versico VWC-9 Termination Detail.
2. On vertical surfaces, such as walls, curbs and pipes, VersiWeld Bonding Adhesive is not required when flashing height is 12" or less and membrane is terminated under a metal counterflashing (nailed). When a coping or termination bar is used for vertical terminations, Bonding Adhesive may be eliminated for flashing heights 18" or less.

E. Other Related Work

1. **Walkways** are required for all traffic concentration points (i.e., roof hatches, access doors, rooftop ladders, etc.), regardless of traffic frequency. Walkways are also required if regular maintenance (once a month or more) is necessary to service rooftop equipment. Walkways are considered a maintenance item and are excluded from the Versico Warranty.
2. VersiWeld Heat Weldable Walkway Rolls are required when walkway pads are specified and are heat welded to the VersiWeld Membrane. When concrete pavers are used, they shall be loose laid and installed in conjunction with a slip sheet of reinforced membrane or two layers of HP Protective Mat. Concrete pavers are not recommended when the roof slope is greater than 2" per horizontal foot.

Versico Interlocking Rubber Pavers, 24" X 24" X 2", weighing approximately 6 pounds per square foot, may be interlocked and loose laid directly over the membrane. Installation instruction sheets are available

from Versico.

3. **Copings, counterflashing and other metal work**, not supplied by Versico, shall be fastened to prevent metal from pulling free or buckling and sealed to prevent moisture from entering the roofing system or building.

Attach copies of the applicable Versico Details which pertain to the individual project to complete a bid package submittal.

Membrane Physical Properties

Property (Metric-SI Units)	Test Method	Property of Unaged Sheet 45 or 60-mil		Property After Aging (1) 28 days @ 240° F 45 or 60-mil	
Tolerance on Nominal Thickness, %	ASTM D 751	±10		±10	
Thickness Over Scrim, min, in. (mm)	ASTM D 6878 Optical Method	45-mil 0.015 (0.381) ±10	60-mil 0.020 (0.508) ±10		
Breaking Strength, min, lbf (kN)	ASTM D 751 Grab Method	45-mil 225 (1.0) Min. 320 (1.4) Typical	60-mil 250 (1.1) Min. 360 (1.6) Typical	45-mil 225 (1.0) Min. 320 (1.4) Typical	60-mil 250 (1.1) Min. 360 (1.6) Typical
Elongation at Break of Fabric, min, %	ASTM D 751	25 Typical		25 Typical	
Tearing Strength, min, lbf (N) 8" by 8" specimen	ASTM D 751 B Tongue Tear	55 (245) Min. 130 (578) Typical		55 (245) Min. 130 (578) Typical	
Brittleness Point, max, °F (°C)	ASTM D 2137	-40 (-40) Min. -50 (-46) Typical			
Linear Dimensional Change (shrinkage), %	ASTM D 1204			+/- .05 max -0.2 Typical	
Ozone Resistance, 100 pphm, 168 hours	ASTM D 1149	No Cracks		No Cracks	
Resistance to Water Absorption After 7 days immersion @ 158°F (70°C) Change in mass, max, %	ASTM D 471 (Top Surface Only)			4.0 max 2.0 Typical	
Resistance to microbial surface growth, rating (1 is very poor, 10 is no growth)	ASTM D 3274 2 yr. S. Florida			9 – 10 Typical	
Field seam strength, lbf/in. (kN/m) Seam tested in peel	ASTM D1876	25 (4.4) Min. 60 (10.5) Typical			
Water vapor permeance, Perms	ASTM E 96	0.10 Max. 0.05 Typical			
Puncture resistance, lbf (N)	FTM 101C Method 2031	45-mil 250 (1.1) Min. 325 (1.4) Typical	60-mil 300(1.3) Min. 350 (1.6) Typical		
Resistance to xenon-arc Weathering (2) Xenon-Arc, 10,080 kJ/m total radiant exposure, Visual condition at 10X	ASTM G 155 0.70 W/m 80°C B.P.T.			No Cracks No loss of breaking or tearing strength	
(1) Aging conditions are 28 days at 240° F (116° C) equivalent to 400 days at 176° F (80° C) for breaking strength, elongation, tearing strength, linear dimensional change, ozone and puncture resistance.					
(2) Approximately equivalent to 8000 hours exposure at 0.35W/m.					

Note: For Physical Properties of the 72 and 80-mil VersiWeld membrane, refer to the VersiWeld Design Criteria Specification, Part I.

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