Senergy Senershield-R Air/Water-Resistive Barrier Section
072700
Fluid-applied, vapor permeable membrane air/water resistive barrier

INTRODUCTION
This specification has been assembled to enable the design professional to select or delete sections to suit the project requirements and is intended to be used in conjunction with Senergy® product bulletins, technical bulletins, etc.

DESIGN RESPONSIBILITY
It is the responsibility of both the specifier and the purchaser to determine if a product is suitable for its intended use. The designer selected by the purchaser shall be responsible for all decisions pertaining to design, detail, structural capability, attachment details, shop drawings and the like. The Wall Systems business of BASF Corporation (herein referred to as “BASF Wall Systems”) has prepared guidelines in the form of specifications, typical application details, and product bulletins to facilitate the design process only. BASF Wall Systems is not liable for any errors or omissions in design, detail, structural capability, attachment details, shop drawings or the like, whether based upon the information provided by BASF Wall Systems or otherwise, or for any changes which the purchasers, specifiers, designers or their appointed representatives may make to BASF Wall Systems published comments.

Designing and Detailing a wall system utilizing Senergy SENERSHIELD-R air/water-resistive barrier
General: The Senergy SENERSHIELD-R shall be installed in strict accordance with current recommended application procedures and product specifications from the system’s manufacturer.

A. Substrate Systems
1. Acceptable substrates are: PermaBase® Cement Board and other cement-boards conforming with ASTM C1325 (Type A-exterior); poured concrete/unit masonry; ASTM C1177 type sheathings, including, Weather Defense™ Platinum sheathing, GreenGlass® sheathing, eXP™ sheathing, GlasRoc® sheathing, Securock™ glass-mat sheathing, and DensGlass® exterior sheathing; gypsum sheathing (ASTM C79/C1396); Exposure I or exterior plywood (Grade C/D or better); or Exposure I OSB.
2. Surfaces of unit masonry and concrete shall receive an application of SENERSHIELD-R not less than 20 wet mils thick achieving a void and pinhole free application. The application of multiple coats may be required.
3. The substrate systems shall be engineered with regard to structural performance by others.

B. Moisture Control
1. Prevent the accumulation of water behind the exterior cladding system, either by condensation or leakage through the wall construction, in the design and detailing of the wall assembly.
   a. Provide flashing to direct water to the exterior where it is likely to penetrate components in the wall assembly, including, above window and door heads, beneath window and door sills, at roof/wall intersections, decks, abutments of lower walls with higher walls, above projecting features, and at the base of the wall and anywhere else required by local code.
   b. Air Leakage Prevention: provide continuity of air barrier system at foundation, roof, windows, doors and other penetrations through the system with connecting and compatible air barrier components to minimize condensation and leakage caused by air movement.
   c. Vapor Diffusion and Condensation: perform a dew point analysis of the wall assembly to determine the potential for accumulation of moisture in the wall assembly as a result of water vapor diffusion and condensation. Adjust insulation thickness/location and/or other wall assembly components accordingly to minimize the risk of condensation.
   d. Avoid the use of vapor retarders on the interior side of the wall in warm, humid climates. The selection, use and placement of vapor barriers within a wall assembly is the sole responsibility of the design professional.
Senershield-R Air/Water-Resistive Barrier

C. Grade Condition
   1. Senergy SENERSHIELD-R is not intended for use below grade or on surfaces subject to continuous or intermittent immersion in water or hydrostatic pressure.

D. Coordination with other trades
   1. Evaluate adjacent materials such as windows, doors, etc. for conformance to manufacturer’s details. Adjacent trades shall provide scaled shop drawings for review.
   2. Air Seals at any joints/gaps between adjoining components (penetrations, etc.) are of primary importance to maintain continuity of an air barrier system and must be considered by the design professional in the overall wall assembly design. Install air seals between the primary air/water-resistive barrier and other wall components (penetrations, etc.) in order to maintain continuity of an air barrier system.
   3. Provide protection of rough openings in accordance with Senergy’s Moisture Protection Guidelines for Senerflex Wall Systems before installing windows, doors, and other penetrations through the wall.

TECHNICAL INFORMATION
Consult BASF Wall Systems’ Technical Services Department for specific recommendations concerning all other applications. Consult the Senergy website, www.senergy.basf.com, for additional information about products and systems and for updated literature.
PART 1 – GENERAL

NOTE TO SPECIFIER: Items in blue/underlined indicate a system option or choice of options. Throughout the specification, delete those which are not required or utilized.

1.01 SECTION INCLUDES
A. Refer to all drawings and other sections of this specification to determine the type and extent of work therein affecting the work of this section, whether or not such work is specifically mentioned herein.
B. Senergy SENERSHIELD-R: Ready mixed flexible, fluid applied, vapor permeable, and air/water resistive barrier for use behind most exterior wall claddings.
C. Senergy products are listed in this specification to establish a standard of quality. Any substitutions to this specification shall be submitted to and receive approval from the Architect at least 10 days before bidding. Proof of equality shall be borne by the submitter.
D. The air/water-resistive barrier material shall be Senergy SENERSHIELD-R as manufactured by BASF Wall Systems, Jacksonville, Florida.

1.02 RELATED SECTIONS
A. Section 03 00 00 Concrete substrate
B. Section 04 00 00 Masonry substrate
C. Section 05 40 00 Cold-formed metal framing
D. Section 06 16 00 Sheathing
E. Section 06 11 00 Wood framing
F. Section 07 27 00 Air barriers
G. Section 07 62 00 Sheet Metal Flashing and Trim
H. Section 07 65 00 Flexible flashing
I. Section 07 90 00 Joint protection
J. Section 08 00 00 Openings
K. Section 08 50 00 Windows
L. Section 09 22 16 Non-structural metal framing
M. Section 09 29 00 Gypsum board

1.03 DEFINITIONS
A. Air Barrier Assembly: The collection of air barrier materials and auxiliary materials applied to an opaque wall, including joints and junctions to abutting construction, to control air movement through the wall.
B. Water-Resistive Barrier Assembly: The collection of water-resistive materials and accessories that direct incidental water that may pass the primary rainscreen, or condense within the drain plane, out of the wall cladding while providing protection for underlying sheathing materials.

1.04 SUBMITTALS
A. Submit under provisions of Section [01 33 00]
B. Product Data: Provide data on Senergy SENERSHIELD-R Air/Water resistive Barrier, product characteristics, performance criteria and limitations.
C. Code Compliance: Provide manufacturer’s applicable code compliance report.
D. Certificate: System manufacturer’s approval of applicator.
E. Sealant: Sealant manufacturer’s certificate of compliance with ASTM C1382.
F. System manufacturer’s current specifications, typical details and related product literature which indicate preparation required storage, installation techniques and jointing requirements.

1.05 PERFORMANCE REQUIREMENTS
A. General: Air barrier shall be capable of performing as a continuous vapor-permeable air barrier and as a liquid-water drainage plane flashed to discharge to the exterior incidental condensation or water penetration. At wall cladding transitions, the air/water-resistive barrier shall form a continuous air barrier and shall make provision for water drainage, either by creation of an unobstructed drainage plane that extends across the cladding transition or by flashing to discharge to the exterior at the transition. Air barrier assemblies shall be capable of accommodating substrate movement and sealing substrate expansion and control joints, construction material changes and transitions at perimeter.
conditions without deterioration and air leakage exceeding specified limits or interruption of the drainage plane.

B. Commonwealth of Massachusetts Building Code Requirements: The intent of this specific action is to require compliance with 780 CMR 13, Section 1304.3 Air Leakage.

1. 1304.3.1 Air Barriers: The building envelope shall be designed and constructed with a continuous air barrier to control air leakage into, or out of the conditioned space. An air barrier shall also be provided for interior partitions between conditioned space and space designed to maintain temperature or humidity levels which differ from those in the conditioned space by more than 50% of the difference between the conditioned space and design ambient conditions. The air barrier shall have the following characteristics:
   a. It must be continuous, with all joints made airtight.
   b. It shall have an air permeability not to exceed 0.004 cfm/sq. ft. under a pressure differential of 0.3 in. water. (1.57 psf.) (equal to 0.02L/sq. m @ 75 Pa.).
   c. It shall be capable of withstanding positive and negative combined design wind, fan and stack pressures on the envelope without damage or displacement, and shall transfer the load to the structure. It shall not displace adjacent materials under full load.
   d. It shall be durable or maintainable.
   e. The air barrier shall be joined in an airtight and flexible manner to the air barrier material of adjacent systems, allowing for the relative movement of systems due to thermal and moisture variations and creep. Connection shall be made between:
      i. Foundation and walls.
      ii. Walls and windows or doors.
      iii. Different wall systems.
      iv. Wall and roof.
      v. Wall and roof over unconditioned space.
      vi. Walls, floor and roof across construction, control and expansion joints.
      vii. Walls, floors and roof to utility, pipe and duct penetrations.
   f. All penetrations of the air/water resistive barrier and paths of air infiltration/exfiltration shall be made airtight.

C. Testing:

1. General Air/Water-Resistive Barrier Minimum Performance:

<table>
<thead>
<tr>
<th>TEST</th>
<th>METHOD</th>
<th>CRITERIA</th>
<th>RESULTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water-resistive barrier coatings</td>
<td>ASTM E2570</td>
<td>Meets all performance requirements</td>
<td></td>
</tr>
<tr>
<td>used under EIFS</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Air Leakage of Air Barrier</td>
<td>ASTM E2357</td>
<td>0.2 l/(s.m2) @ 75 Pa (0.04 cfm/ft2 @ 1.57 psf)</td>
<td>0.0007 l/s.m2 (0.0001 cfm/ft2 ) @ 75 Pa (1.57 psf) positive / post conditioning</td>
</tr>
<tr>
<td>Assemblies</td>
<td></td>
<td></td>
<td>0.0014 l/s.m2 (0.0003 cfm/ft2 ) @ 75 Pa (1.57 psf) negative / post conditioning</td>
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<tr>
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</tr>
<tr>
<td>Air Permeance of Building Materials</td>
<td>ASTM E2178</td>
<td>0.02 l/(s.m2) @ 75 Pa (0.004 cfm/ft2 @ 1.57 psf)</td>
<td>0.0049 l/s.m2 @ 75 Pa (0.00098 cfm/ft2 @ 1.57 psf)</td>
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<tr>
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</tr>
<tr>
<td>Rate of Air Leakage</td>
<td>ASTM E283</td>
<td>0.0185 l/s.m2 @ 75 Pa (0.0037 cfm/ft2 @ 1.57 psf)</td>
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<tr>
<td>Water Vapor Transmission</td>
<td>ASTM E96</td>
<td>Report value</td>
<td>Senershield-R - 18 Perms (grains/Hr. in Hg. ft2) @ 10 mils wet film thickness</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Senershield-R - 14 Perms (grains/Hr. in Hg. ft2) @ 20 mils wet film thickness</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Senershield-VB - 0.09 Perms (grains/Hr. in Hg. ft2) @ 26 mils wet film thickness</td>
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<td></td>
</tr>
<tr>
<td>Pull-Off Strength of Coatings</td>
<td>ASTM D4541</td>
<td>Min. 110 kPa (15.9 psi) or substrate failure</td>
<td>Pass - Tested over exterior gypsum sheathing, ASTM C1177 glass-mat sheathing, cement board, OSB, plywood; pvc and galvanized flashing</td>
</tr>
<tr>
<td>(without Sheathing Fabric)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nail Sealability (without Sheathing</td>
<td>ASTM D1970</td>
<td>No water penetration at galvanized roofing nail penetration under 127 mm</td>
<td>Pass</td>
</tr>
<tr>
<td>Fabric)</td>
<td></td>
<td>(5”) head of water after 3 days at 4° C (40° F)</td>
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</tr>
<tr>
<td>Surface Burning</td>
<td>ASTM E84</td>
<td>Flame Spread &lt; 25</td>
<td>Meets Class A: Flame spread =15</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Smoke Development &lt; 450</td>
<td>Smoke developed = 95</td>
</tr>
<tr>
<td>Radiant Heat Multi-Story Tests</td>
<td>NFPA 268 &amp;</td>
<td></td>
<td>Pass using many wall designs; including Senergy EIFS cladding with 12” EPS</td>
</tr>
<tr>
<td></td>
<td>NFPA 285</td>
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</tr>
</tbody>
</table>
## Senershield-R Air/Water-Resistive Barrier

### Insulation

- **Water Resistive Barrier under EIFS**: ASTM E2570. Meets all criteria in the standard.
- **Compound Stability (Elevated Temperature)**: ASTM D5147 Section 15. No flowing, dripping, or drop formation up to 177°C (350°F).
- **Fire Resistance**: ASTM E119/UL 263. Will not add or detract from the rating of a fire resistant wall assembly.
- **Drainage Efficiency**: ASTM E 2273. 99%

### Test Results

#### 2. SENERSHIELD-R Air/Water-Resistive Barrier ICC-ES AC-212:

<table>
<thead>
<tr>
<th>Test Description</th>
<th>Method</th>
<th>Criteria</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sequential Testing: 1. Structural</td>
<td>ASTM E 1233 Procedure A</td>
<td>No cracking at joints or interface of flashing</td>
<td>Pass - Tested over OSB and gypsum sheathing, No water penetration after 15 min @ 137 Pa (2.86 psf)</td>
</tr>
<tr>
<td>2. Racking</td>
<td>ASTM E 72</td>
<td>No water penetration after 15 min @ 137 Pa (2.86 psf)</td>
<td></td>
</tr>
<tr>
<td>3. Restrained Environmental Conditioning</td>
<td>ICC-ES AC-212</td>
<td>No cracking or bond failure to substrate</td>
<td>Pass - Tested over exterior gypsum sheathing, ASTM C1177 glass-mat sheathing, cement board, OSB, plywood</td>
</tr>
<tr>
<td>4. Water Penetration</td>
<td>ASTM E 331</td>
<td>No water penetration after 21.7 in (550 mm) water for 5 hours</td>
<td></td>
</tr>
<tr>
<td>Freeze-Thaw</td>
<td>ASTM E 2485 Method B</td>
<td>No sign of deleterious effects after 10 cycles</td>
<td></td>
</tr>
<tr>
<td>Water Resistance</td>
<td>ASTM D2247</td>
<td>No deleterious effects after 14 day exposure</td>
<td></td>
</tr>
<tr>
<td>Tensile Bond</td>
<td>ASTM C 297</td>
<td>Minimum 103 kPa (15 psi)</td>
<td></td>
</tr>
<tr>
<td>Tensile Bond (after freeze-thaw)</td>
<td>ASTM C 297</td>
<td>Minimum 103 kPa (15 psi) avg; no failure after 10 cycles freeze-thaw</td>
<td></td>
</tr>
</tbody>
</table>

#### 3. SENERSHIELD-R Air/Water-Resistance Barrier ICC-ES AC 148:

<table>
<thead>
<tr>
<th>Test Description</th>
<th>Method</th>
<th>Criteria</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sequential Testing: 1. UV Light Exposure</td>
<td>ICC-ES AC-148</td>
<td>No cracking or bond failure to substrate</td>
<td>Pass - Tested over ASTM C1177 glass-mat sheathing, cement board, OB, plywood</td>
</tr>
<tr>
<td>2. Accelerated Aging</td>
<td>ICC-ES AC-148</td>
<td>No water penetration after 21.7 in (550 mm) water for 5 hours</td>
<td></td>
</tr>
<tr>
<td>3. Hydrostatic Pressure Test</td>
<td>AATCC 127-1985</td>
<td>No cracking or bond failure to substrate</td>
<td>Pass - Tested over exterior gypsum sheathing, ASTM C1177 glass-mat sheathing, cement board, OSB, plywood</td>
</tr>
<tr>
<td>Peel Adhesion</td>
<td>ASTM D 3330 Method F</td>
<td>After UV Exposure After Accelerated Aging After Elevated Temperature Exposure After Water Immersion</td>
<td>Pass - tested over ASTM C1177 glass-mat sheathing, OSB, plywood, PVC and uncoated aluminum</td>
</tr>
<tr>
<td>Nail Sealability after Thermal Cycling</td>
<td>ASTM D 1970 (Modified), AAMA 711</td>
<td>No water penetration at galvanized roofing nail penetration under 31 mm (1.2&quot;) head of water after 24 hours at 4°C (40°F)</td>
<td></td>
</tr>
<tr>
<td>Tensile Strength after UV Exposure</td>
<td>ASTM D 5034, AAMA 711</td>
<td>Minimum 0.5 N/mm (2.9 lbs/in)</td>
<td></td>
</tr>
<tr>
<td>Cold Temperature Pliability</td>
<td>ASTM D 1970, AAMA 711</td>
<td>No cracking after bending around a 25 mm (1&quot;) mandrel after 2 hour exposure to -18°C (0°F)</td>
<td></td>
</tr>
<tr>
<td>Resistance to Peeling</td>
<td>AAMA 711</td>
<td>No signs of distress or failure after 24 hours of exposure at room temperature, 50°C (122°F), 85°C (149°F), 80°C (176°F)</td>
<td></td>
</tr>
</tbody>
</table>

#### 4. MAXFLASH AAMA 714-15
### Senershield-R Air/Water-Resistive Barrier

<table>
<thead>
<tr>
<th>TEST</th>
<th>METHOD</th>
<th>CRITERIA</th>
<th>RESULTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peel Adhesion</td>
<td>ASTM C794</td>
<td>Tested over ASTM C1177 sheathing, plywood, OSB, concrete (mortar), CMU,</td>
<td>Pass control and after conditioning, min. 5 pli</td>
</tr>
<tr>
<td></td>
<td>Control AAMA 714 Sec 5.1</td>
<td>galvanized steel, aluminum</td>
<td></td>
</tr>
<tr>
<td></td>
<td>UV exposure Sec 5.3, ASTM G154</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Elevated temperature AAMA 714 Sec 5.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Thermal cycling AAMA 714 Sec 5.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>7 day water immersion AAMA 714 Sec 5.7</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Crack Bridging</td>
<td>AAMA 714 Sec 5.6, ASTM C1305</td>
<td>No failure after 10 cycles with 1/8” gap and water holdout of 550 mm (21.7”) for 24 hours, tested at 60 mils per ASTM C1305</td>
<td>Pass</td>
</tr>
<tr>
<td>Nail Sealability</td>
<td>AAMA 714 Sec 5.2 (AAMA 711 Sec 5.2), modified ASTM D1970 sec 7.9</td>
<td>No failure before and after thermal cycling, 24 hours at 40°F with 31.75 mm (1 ¼”) head of water</td>
<td>Pass</td>
</tr>
<tr>
<td>Accelerated Aging</td>
<td>AAMA 714 Sec 5.3, ASTM G154, Cycle 1</td>
<td>No deleterious effects such as wrinkling, distortion, blistering, expansion, shrinkage or warpage after 14 days (336 hours) to Cycle 1 of G154</td>
<td>Pass</td>
</tr>
<tr>
<td>Elevated Temperature</td>
<td>AAMA 714 Sec 5.4</td>
<td>No deleterious effects such as wrinkling, distortion, blistering, expansion, shrinkage or warpage at 50°C (122°F), 65°C (149°F) and 80°C (176°F)</td>
<td>Pass</td>
</tr>
<tr>
<td>Thermal Cycling</td>
<td>AAMA 714 Sec 5.5</td>
<td>No deleterious effects such as wrinkling, distortion, blistering, expansion, shrinkage or warpage after 10 cycles</td>
<td>Pass</td>
</tr>
<tr>
<td>Water Immersion</td>
<td>AAMA 714 Sec 5.7</td>
<td>No deleterious effects such as wrinkling, distortion, blistering, expansion, shrinkage or warpage after 10 cycles</td>
<td>Pass</td>
</tr>
<tr>
<td>Adhesion to Damp Substrates</td>
<td>AAMA 714 Sec 6.1 and 6.2</td>
<td>Minimum 5 pli, over OSB and mortar (absorptive substrates)</td>
<td>Pass</td>
</tr>
<tr>
<td>Water Vapor Permeability</td>
<td>AAMA 714 Sec 6.3, ASTM E96 Method B</td>
<td>0.2 l/(s.m2) @75 Pa (0.04 cfm/ft2 @ 1.57 psf)</td>
<td>19.9 perms @ 12 mils 7.2 perms @ 30 mils</td>
</tr>
</tbody>
</table>

**Note:** all testing with MaxFlash at 12 mils unless otherwise noted

5. MAXFLASH AAMA 711-13 - Voluntary Specification for Self-Adhering Flashing Used for Installation of Exterior Wall Fenestration Products

<table>
<thead>
<tr>
<th>TEST</th>
<th>METHOD</th>
<th>CRITERIA</th>
<th>RESULTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peel Adhesion</td>
<td>ASTM D3330</td>
<td>Tested over ASTM C1177 sheathing, plywood, OSB, PVC, galvanized steel, aluminum</td>
<td>Pass control and after conditioning, minimum 1.5 pli</td>
</tr>
<tr>
<td></td>
<td>Method F Control AAMA 711 Sec 5.3</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>UV exposure Sec 5.4, ASTM G154</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Elevated temperature AAMA 711 Sec 5.5</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Thermal cycling AAMA 711 Sec 5.6</td>
<td></td>
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<tr>
<td></td>
<td>7 day water immersion AAMA</td>
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<tr>
<td>Test</td>
<td>Method</td>
<td>Criteria</td>
<td>Results</td>
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<tr>
<td>-----------------------------</td>
<td>---------------------------------------------</td>
<td>---------------------------------------------------------------------------</td>
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</tr>
<tr>
<td>Structural</td>
<td>AC-212 Sec. 4.2</td>
<td>No cracking at joints or interface of flashing</td>
<td>Pass</td>
</tr>
<tr>
<td>Racking</td>
<td>1. ASTM E 1233</td>
<td>No water penetration after 15 min @ 137 Pa (2.86 psf)</td>
<td></td>
</tr>
<tr>
<td>Restrained</td>
<td>2. ASTM E 72</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Environmental Conditioning</td>
<td>3. AC-212 Sec.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. ASTM E 331</td>
<td></td>
<td></td>
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<tr>
<td>Water Penetration</td>
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</tr>
<tr>
<td>UV Light Exposure</td>
<td>AC-212 Sec. 4.8</td>
<td>No cracking or bond failure after 210 hrs</td>
<td>Pass</td>
</tr>
<tr>
<td>Accelerated Aging</td>
<td>1. AC-212 Sec.</td>
<td>No cracking or bond failure after 25 cycles</td>
<td></td>
</tr>
<tr>
<td>Hydrostatic Pressure Test</td>
<td>2. AC-212 Sec.</td>
<td>No water penetration under 550 mm (21.7&quot;) head of water</td>
<td></td>
</tr>
<tr>
<td>3. AATCC 127</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Freeze-Thaw</td>
<td>AC-212 Sec. 4.2</td>
<td>10 cycles, no deleterious effects such as cracking, checking, crazing or</td>
<td>Pass</td>
</tr>
<tr>
<td></td>
<td></td>
<td>erosion, viewed at 5x magnification</td>
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<tr>
<td>Water Resistance</td>
<td>AC-112 Sec. 4.3</td>
<td>No deleterious effects after 14 day exposure</td>
<td>Pass</td>
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<td></td>
<td>ASTM D2247</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tensile Bond</td>
<td>ASTM C 297</td>
<td>Minimum 103 kPa (15 psi)</td>
<td>Pass</td>
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</tbody>
</table>
Senershield-R Air/Water-Resistive Barrier

### Tensile Bond

**AC-212 Sec. 4.1 ASTM C 297**

- Minimum 103 kPa (15 psi) avg; no failure after 10 cycles freeze-thaw
- Pass 105 kPa (15 psi) - Tested over ASTM C1177 sheathing, plywood, OSB, cement board, PVC, aluminum, galvanized steel and stainless steel

### Water Vapor Permeability

**AC-212 Sec. 4.4 ASTM E96 Method B**

- Report Value
- Pass 105 kPa (15 psi)
- Tested over ASTM C1177 sheathing, plywood, OSB, cement board, PVC, aluminum, galvanized steel and stainless steel

### Water Penetration

**AC-212 Sec. 4.5 ASTM E331**

- No water penetration at:
  - 137 Pa (2.86 psf)
  - 299 Pa (6.24 psf)
  - 575 Pa (12 psf)
- Pass, testing performed with MaxFlash exposed over sheathing joints.

### Air Permeance of Building Materials

**ASTM E2178**

- 0.02 l/(s.m²) @75 Pa
- 0.00410 L/s.m² @ 75 Pa
- 0.00410 L/s.m² @ 75 Pa
- 0.00082 cfm/ft² @ 1.57 psf
- Performed on 12 mil thick free film sample

**Note:** all testing with MaxFlash at 20 mils unless otherwise noted

### General Liquid Flashing Minimum Performance:

<table>
<thead>
<tr>
<th>TEST</th>
<th>METHOD</th>
<th>CRITERIA</th>
<th>RESULTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Air Permeance of Building Materials</td>
<td>ASTM E2178</td>
<td>0.02 l/(s.m²) @75 Pa (0.004 cfm/ft² @ 1.57 psf)</td>
<td>0.00410 L/s-m² @ 75 Pa (0.00082 cfm/ft² @ 1.57 psf), performed on free film sample</td>
</tr>
<tr>
<td>Air Leakage of Air Barrier Materials</td>
<td>ASTM E2357</td>
<td>0.2 l/(s.m²) @75 Pa (0.04 cfm/ft² @ 1.57 psf)</td>
<td>TBD</td>
</tr>
<tr>
<td>Nail Sealability</td>
<td>ASTM D1970 Sec. 7.9</td>
<td>No water penetration at galvanized roofing nail penetration under 127 mm (5&quot;) head of water after 3 days at 4°C (40°F)</td>
<td>Pass, before and after thermal cycling, 3 days at 40°F with 127 mm (5&quot;) head of water</td>
</tr>
<tr>
<td>Surface Burning</td>
<td>ASTM E84</td>
<td>Flame Spread &lt; 25 Smoke Development &lt; 450</td>
<td>Pass, tested at 30 mils</td>
</tr>
</tbody>
</table>

1.06 QUALITY ASSURANCE

A. Manufacturer: More than 10 years in the EIFS industry, with more than 1000 completed EIFS projects.

B. Applicator: Approved by BASF Wall Systems in performing work of this section.

C. Regulatory Requirements: Conform to applicable code requirements for air/water resistive barriers.

D. Source Limitations: Obtain primary air-barrier material and through wall flashing through one source from or approved by a single manufacturer.

E. Mockups: Before beginning installation of air barrier, provide air barrier work for exterior wall assembly mockups, incorporating backup wall construction, external cladding, window, door frame and sill, insulation, and flashing to demonstrate surface preparation, crack and joint treatment, and sealing of gaps, terminations, and penetrations of air barrier membrane.

1. Coordinate construction of mockup to permit inspection by Owner's testing agency of air barrier before external insulation and cladding is installed.

2. If Architect determines mockups do not comply with requirements, reconstruct mockups and apply air barrier until mockups are approved.

F. Pre-Installation Conference: A pre-installation conference shall be held prior to commencement of field operations to establish procedures to maintain optimum working conditions and to coordinate this work with related and adjacent work. Pre-installation conference shall include the Contractor, installer, Architect, and system manufacturer's field representative. Agenda for meeting shall include but not be limited to the following:

1. Review of submittals.
2. Review of surface preparation, minimum curing period and installation procedures.
3. Review of special details and flashings.
4. Sequence of construction, responsibilities and schedule for subsequent operations.
5. Review of mock-up requirements.
6. Review of inspection, testing, protection and repair procedures.

1.07 DELIVERY, STORAGE AND HANDLING
**Senershield-R Air/Water-Resistive Barrier**

A. Deliver, store and handle products under provisions of Section [01 65 00] [01 66 00] [
B. Deliver Senergy SENERSHIELD-R and associated materials in original unopened packages with manufacturer’s labels intact.
C. Protect Senergy SENERSHIELD-R and associated materials during transportation and installation to avoid physical damage.
D. Store Senergy SENERSHIELD-R in cool, dry place protected from freezing. Store at no less than 4°C/40°F.
E. Store Senergy SENERSHIELD-R and associated materials protected from direct sunlight and extreme heat.
F. Store Senergy SHEATHING FABRIC and WS WRAP flexible flashing in cool, dry place protected from exposure to moisture.
G. Store MAXFLASH at a minimum of 40F. In cold weather, keep containers at room temperature for at least 24 hours before using.

1.08 PROJECT/SITE CONDITIONS
A. Do not apply Senergy SENERSHIELD-R in ambient temperatures below 4°C/40°F. If LT ADDITIVE is used, do not apply in ambient temperatures below -3°C/25°F. Provide properly vented, supplementary heat during installation and drying period when temperatures less than 4°C/40°F prevail.
B. Do not apply Senergy SENERSHIELD-R and associated materials to frozen surfaces.
C. Maintain ambient temperature at or above 4°C/40°F during and at least 24 hours after application of Senergy SENERSHIELD-R and associated materials installation and until dry.
D. Limit exposure of Senergy SENERSHIELD-R and associated products to a maximum of 180 days.

1.09 SEQUENCING AND SCHEDULING
A. Coordinate and schedule installation of Senergy SENERSHIELD-R and associated materials with related work of other sections.
B. Coordinate and schedule installation of flashing and joint sealers to prevent water infiltration behind the exterior cladding system.

1.10 WARRANTY
A. Material Warranty: Provide BASF Wall Systems five-year limited materials warranty for Senergy SENERSHIELD-R installations under provisions of Section [01 70 00].
   1. Comply with BASF Wall Systems applicator approval requirements and notification procedures to assure qualification for warranty.

PART 2 - PRODUCTS
2.01 MANUFACTURERS
A. Senergy SENERSHIELD-R Air/Water-Resistive Barrier manufactured by BASF Wall Systems.

2.02 MATERIALS
**NOTE TO SPECIFIER:** Items in blue/underlined indicate a system option or choice of options. Throughout the specification, delete those which are not required or utilized. Contact BASF Wall Systems Technical Service Department for further assistance.
A. Air/Water Resistive Barrier Components:
   1. Air/Water-Resistive Barrier:
      a. SENERSHIELD-R: A one-component fluid-applied vapor permeable air/water-resistive barrier.
   2. Rough Opening and Joint Treatment: (Required, Select a or b)
      a. SHEATHING FABRIC: A spun-bonded non-woven reinforced polyester web for use with Senergy fluid applied air/weather-resistive barriers.
      b. MAXFLASH: A one-component elastomeric material for use as a flexible flashing membrane.
   3. Transitional Membrane / Expansion Joint Flashing (If selected, both a & b are required)
      b. FLASHING PRIMER: A water-based primer for use prior to application of WS FLASH on all acceptable surfaces.
   4. Cold Temperature Additive:
Senershield-R Air/Water-Resistive Barrier

a. **LT ADDITIVE**: Blending of LT ADDITIVE with a pail of SENERSHIELD-R enables application of these materials at temperatures as low as -4°C (25°F).

### 2.03 ACCESSORIES

A. **Sprayed Polyurethane Foam Sealant**: 1- or 2-component, foamed-in-place, polyurethane foam sealant, 1.5 to 2.0 lb/cu. ft (24 to 32 kg/cu. m) density; flame spread index of 25 or less according to ASTM E162; with primer and noncorrosive substrate cleaner recommended by foam sealant manufacturer.


### PART 3 EXECUTION

#### 3.01 EXAMINATION

A. **Site Conditions**:
   1. Verify project site conditions under provisions of Section [01 00 00].

B. **Walls**:
   1. **Substrates**:
      a. Roller applied air/water-resistive barrier acceptable substrates: Acceptable substrates are: PermaBase® Cement Board and other cement-boards conforming with ASTM C1325 (Type A-exterior); poured concrete/unit masonry; ASTM C1177 type sheathings, including, Weather Defense™ Platinum sheathing, GreenGlass® sheathing, eXP™ sheathing, GlasRoc® sheathing, Securock™ glass-mat sheathing, and DensGlass® exterior sheathing; gypsum sheathing (ASTM C79/C1396); Exposure I or exterior plywood (Grade C/D or better); or Exposure I OSB. Consult the BASF Wall Systems Technical Services Department for all other applications.
      b. Wall sheathing must be securely fastened per applicable building code and sheathing manufacturer’s requirements.
      c. Examine surfaces to receive SENERSHIELD-R air/water resistive barrier and verify that substrate and adjacent materials are dry, clean, sound, and free of releasing agents, paint, or other residue or coatings. Verify substrate is flat, free of fins or planar irregularities greater than 6.4 mm in 3 m (1/4” in 10').
      d. Verify that concrete is visibly dry and free of moisture. Test for capillary moisture by plastic sheet method according to ASTM D4263.
      e. Verify that masonry joints are struck flush and completely filled with mortar.
   2. **Flashings**:
      a. All flashings are by others and must be installed in accordance with specific manufacturer’s requirements. Where appropriate, end-dams must be provided.
      b. Openings must be flashed prior to window/door, HVAC, etc. installation. Refer to WS FLASH product bulletin and the *Moisture Protection Guidelines for Senerflex Wall Systems* bulletin for further information.
      c. Windows and openings shall be flashed according to design and Building Code Requirements.
      d. Individual windows that are ganged to make multiple units require continuous head flashing and the joints between the units must be fully sealed.
   3. **Roof**:
      a. Verify that all roof flashings have been installed in accordance with the guidelines set by the Asphalt Roofing Manufacturers Association (ARMA).
   4. **Kick-out flashing**:
      a. Kick-out flashing must be installed leak-proof and angled (min 100°) to allow for proper drainage and water diversion.

C. **Do not proceed** until all unsatisfactory conditions have been corrected.

#### 3.02 PREPARATION

A. Protect all surrounding areas and surfaces from damage and staining during application of Senergy SENERSHIELD-R Air/Water-Resistive Barrier.

B. Protect finished work at end of each day to prevent water penetration.

C. **Substrate preparation**: Prepare substrates in accordance with Senergy instructions.
Senershield-R Air/Water-Resistive Barrier

3.03 MIXING
General: No additives are permitted unless specified in product mixing instructions. Close containers when not in use. Prepare in a container that is clean and free of foreign substances. Do not use a container which has contained or been cleaned with a petroleum-based product. Clean tools and equipment with water immediately after use. Dried material can only be removed mechanically.

NOTE TO SPECIFIER: Keep only the products in this section which were selected in Section 2.02. Delete those not to be utilized.

A. Air/Water-Resistive Barriers:
   1. SENERSHIELD-R: Mix with a clean, rust-free paddle and drill until thoroughly blended. Do not add water.
   2. Cold Temperature Additive: LT ADDITIVE: Pour the entire contents of one (1) bottle of LT ADDITIVE into one (1) full pail of SENERSHIELD-R. Mix with a clean, rust-free paddle and drill until fully blended.

3.04 APPLICATION
NOTE TO SPECIFIER: Keep only the products in this section which were selected in Section 2.02. Delete those not to be utilized.

A. Air/Water Resistive Barrier:
   1. Substrate shall be installed per substrate manufacturer’s instructions. Substrate shall be dry, clean, sound and free of release agents, paint or other residue or coatings. Verify substrate is flat, free of fins or planar irregularities greater than 6.4 mm in 3 m (1/4” in 10’). Unsatisfactory conditions shall be reported to the general contractor and corrected before application of the air/water-resistive barrier materials.
   2. Rough Openings: (Required, Select a or b)
      a. SHEATHING FABRIC: Wrap openings with SHEATHING FABRIC by applying mixed SENERSHIELD-R to all surfaces and immediately embedding SHEATHING FABRIC. If necessary, apply a second coat of SENERSHIELD-R over the SHEATHING FABRIC ensuring a continuous, void- and wrinkle-free membrane application (wet-on-wet spray application is acceptable).
      b. Apply a bead of MAXFLASH in each corner of the rough opening, ensuring that corners are fully sealed. Where wood bucks are used, apply a bead of MAXFLASH into gaps between bucks and between the buck and building structure. Apply additional MAXFLASH in a zigzag pattern onto head, sill, jambs and exterior substrate. Spread MAXFLASH evenly across the rough opening to form a uniform, continuous, void and pinhole-free membrane with a 12-20 mil thickness. Extend MAXFLASH membrane minimum 4 inches onto the exterior wall, maintaining 12-20 mil thickness. Extend MAXFLASH at a minimum 4 inches onto the exterior wall, maintaining 12-20 mil thickness. Allow MAXFLASH to skin before applying BASF fluid-applied air/water-resistive barrier to sheathing. Lap the air/water-resistive barrier a minimum of 2 inches onto MAXFLASH, creating a continuous, monolithic air/water-resistive barrier membrane. Allow MAXFLASH to cure prior to the installation of windows, doors and other wall assemblies.
   b. Apply a thick bead of MAXFLASH to sheathing joints. Spread MAXFLASH evenly a minimum of 1-inch beyond the joint on either side. Apply 20 mils of MAXFLASH across the sheathing joint. Spot fastener heads with MAXFLASH or BASF fluid-applied air/water-resistive barrier. Allow MAXFLASH to skin before applying BASF fluid-applied air/water-resistive barrier to sheathing.
3. Sheathing Joints: (Required, Select a or b)
   a. SHEATHING FABRIC: Spot all fasteners and precoat sheathing joints, terminations, inside and outside corners with mixed SENERSHIELD-R using a 101 mm (4") wide by 20 mm (3/4") nap roller, brush or spray. Immediately place and center SHEATHING FABRIC over wet SENERSHIELD-R at all sheathing joints, terminations, inside and outside corners, as well as knot holes and check cracks that may exist in plywood or OSB. Ensure SHEATHING FABRIC extends evenly on both sides of the sheathing joint. Completely saturate SHEATHING FABRIC with SENERSHIELD-R. Lap SHEATHING FABRIC 63.5 mm (2 1/2") minimum at intersections. If using roller, brush, or trowel application, allow to dry to the touch before applying Senershield-R to entire wall surface. If spraying, “wet on wet” application is acceptable.
   b. Apply a thick bead of MAXFLASH to sheathing joints. Spread MAXFLASH evenly a minimum of 1-inch beyond the joint on either side. Apply 20 mils of MAXFLASH across the sheathing joint. Spot fastener heads with MAXFLASH or BASF fluid-applied air/water-resistive barrier. Allow MAXFLASH to skin before applying BASF fluid-applied air/water-resistive barrier to sheathing.
4. Field of Substrate: (Required, Select a or b)
a. Apply SENERSHIELD-R to DensGlass™ exterior sheathing, eXP™ sheathing, GlasRoc® sheathing, Securock™ glass-mat sheathing, Weather Defense™ Platinum sheathing, GreenGlass® sheathing, PermaBase™ cement-board by National Gypsum and other cement-boards (ASTM C1325 Type A Exterior) and gypsum sheathing (ASTM C79/ASTM C1396) with a 20 mm (3/4") nap roller, stainless steel trowel, brush or spray gun to a consistent, minimum 10 wet mil thickness that is free of voids and pin holes. A fully loaded roller pad is required to obtain a consistent, minimum 10 wet mil thickness. Back rolling may be needed to produce a pinhole-free film. Note: Refer to Spray Application technical bulletin for spray application equipment and application instructions.

b. Apply SENERSHIELD-R to plywood, OSB or CMU substrate(s) with a 20 mm (3/4") nap roller or spray to a consistent, minimum 10 wet mil thickness. Prior to application of the second coat, visually inspect to assure sheathing surface is blister free and coating is free of voids and pinholes. Repair if needed and then apply a second coat after the initial coating is sufficiently dry.

Note: A minimum of two (2) 10-mil wet coats of SENERSHIELD-R is required over OSB, plywood and CMU. SENERSHIELD-R may be sprayed to a 20-mil thickness over OSB and plywood in one wet application. For spray application, back rolling may be needed to produce a pinhole-free film.

2. Limit the weather exposure of SENERSHIELD-R to a maximum of 180 days. Verify surfaces are free of dirt, contaminants, or other deleterious conditions before application of cladding. Report and correct any such conditions prior to cladding application. Dry/cure times of adhesively applied EPS insulation board installed over SENERSHIELD-R may be prolonged, particularly in cool and/or damp weather. Non-cementitious adhesives are not recommended for EPS insulation board attachment to SENERSHIELD-R.

B. Transition Membrane Installation

1. Install SENERSHIELD-R / SHEATHING FABRIC and/or WS FLASH/FLASHING PRIMER and sealant in accordance with project details & specifications to form a seal with adjacent construction and maintain a continuous air/water-resistive barrier.

a. General Contractor shall make provision to coordinate the installation of air barrier with installation of roofing membrane and base flashing to ensure continuity of air barrier with roofing membrane.

b. General Contractor shall make provision to install strip on roofing membrane or base flashing so that a minimum of 75 mm (3") of coverage is achieved over both substrates.

2. Apply FLASHING PRIMER to substrates scheduled to receive transition membrane as required and at required amount. Apply membrane as soon as possible after FLASHING PRIMER is dry and tacky. Limit priming to areas that will be covered with WS FLASH on the same day. Re-prime areas exposed for more than 24 hours. Using a wallpaper roller, extension-handled counter top roller or weighted hand roller, firmly roll the WS FLASH to the area being sealed. As the WS FLASH is applied, pull more of the release film from the WS FLSH, exposing the adhesive surface, pressing down on the WS FLASH with a roller and keeping the WS FLSH smooth.

3.05 FIELD QUALITY CONTROL

A. Testing Agency: Owner may engage a qualified testing agency to perform tests and inspections and prepare test reports.

B. Inspections: Air barrier materials and installation are subject to inspection for compliance with requirements. Inspections may include the following:

1. Continuity of air barrier system has been achieved throughout the building envelope with no gaps or holes.

2. Continuous structural support of air barrier system has been provided.

3. Masonry and concrete surfaces are smooth, clean and free of cavities, protrusions, and mortar droppings.

4. Site conditions for application temperature and dryness of substrates have been maintained.

5. Maximum exposure time of materials to UV deterioration has not been exceeded.

6. Surfaces have been primed, if applicable.
Senershield-R Air/Water-Resistive Barrier

7. Laps in strips and transition strips have complied with minimum requirements and have been
shingled in the correct direction (or mastic has been applied on exposed edges), with no fish
mouths.
8. Termination sealant has been applied on cut edges.
9. Strips and transition strips have been firmly adhered to substrate.
10. Compatible materials have been used.
11. Transitions at changes in direction and structural support at gaps have been provided.
12. Connections between assemblies (membrane and sealants) have complied with requirements for
cleanliness, preparation and priming of surfaces, structural support, integrity, and continuity of
seal.
13. All penetrations have been sealed.

C. Tests: Testing to be performed will be determined by Owner's testing agency from
among the
following tests:
1. Qualitative Testing: Air barrier assemblies will be tested for evidence of air leakage according to
ASTM E1186, smoke pencil with pressurization or depressurization.

D. Remove and replace deficient air barrier components and retest as specified above.

3.06 CLEANING AND PROTECTION
A. Protect air barrier system from damage during application and remainder of construction period.
B. Protect air barrier from exposure to UV light and harmful weather exposure as required by
manufacturer. Remove and replace air barrier exposed for more than 90 days.
C. Clean spills, stains, and soiling from construction that would be exposed in the completed work using
cleaning agents and procedures recommended by manufacturer of affected construction.
D. Remove masking materials after installation.

END OF SECTION

WARRANTY
BASF warrants this product to be free from manufacturing defects and to meet the technical properties on the current Product
Bulletin, if used as directed within shelf life. Satisfactory results depend not only on quality products but also upon many
factors beyond our control. BASF MAKES NO OTHER WARRANTY OR GUARANTEE, EXPRESS OR IMPLIED,
INCLUDING WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT
TO ITS PRODUCTS. The sole and exclusive remedy of Purchaser for any claim concerning this product, including but not
limited to, claims alleging breach of warranty, negligence, strict liability or otherwise, is shipment to purchaser of product equal
to the amount of product that fails to meet this warranty or refund of the original purchase price of product that fails to meet
this warranty, at the sole option of BASF. In the absence of an extended warranty issued by BASF, any claims concerning
this product must be received in writing within one (1) year from the date of shipment and any claims not presented within
that period are waived by Purchaser. BASF WILL NOT BE RESPONSIBLE FOR ANY SPECIAL, INCIDENTAL,
CONSEQUENTIAL (INCLUDING LOST PROFITS) OR PUNITIVE DAMAGES OF ANY KIND.

Purchaser must determine the suitability of the products for the intended use and assumes all risks and liabilities in
connection therewith. This information and all further technical advice are based on BASF’s present knowledge and
experience. However, BASF assumes no liability for providing such information and advice including the extent to which such
information and advice may relate to existing third party intellectual property rights, especially patent rights, nor shall any legal
relationship be created by or arise from the provision of such information and advice. BASF reserves the right to make any
changes according to technological progress or further developments. The Purchaser of the Product(s) must test the
product(s) for suitability for the intended application and purpose before proceeding with a full application of the product(s).
Performance of the product described herein should be verified by testing and carried out by qualified experts.
Senershield-R Air/Water-Resistive Barrier