

Part 1 – Introduction

1.1 – Products

1.1.1 – EnviroSheet®

EnviroSheet® is a rigid, flat-sheet insulation material made from BASF Styropor® Expanded Polystyrene (EPS).



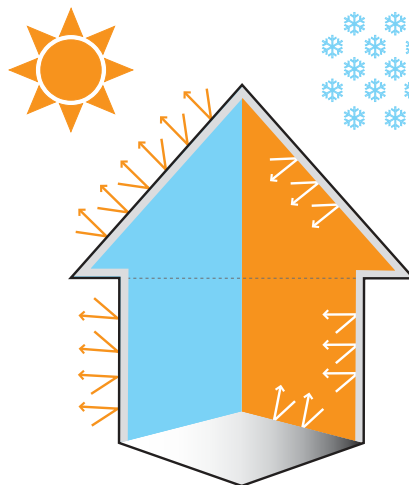
1.1.2 – SilverBoard®

SilverBoard® is rigid, flat-sheet insulation material made from BASF Styropor® Expanded Polystyrene (EPS), which is covered with a layer of polypropylene reflective lamination on both sides. This highly effective combination of materials provides a high performance system which can greatly improve a structure's insulation efficiency.





The reflective lamination used on SilverBoard® provides built-in moisture and air barriers which eliminate the need for house wrap. In addition, when installed with an airspace between SilverBoard® and the finishings, these layers reflect radiant energy at the surface keeping heat out during the summer and keeping heat in during the winter. By reducing heat transfer, SilverBoard® can help prevent heat gain and heat loss due to radiant energy in a structure.



SilverBoard® offers users a high quality product which increases jobsite efficiency and reduces labor costs.



SilveRboard® for Concrete

SilveRboard® for Concrete is a special product designed for applications which require fresh concrete to come directly in contact with the insulation. With this product, one side of the insulation board is covered with a non-reflective lamination (which will be used against the concrete) and the other side is covered with reflective lamination.

1.2 – Applications

Envirosheet® and SilveRboard® are acceptable for roof, floor and wall insulation in residential, agricultural, commercial and industrial construction and can be used for the following applications:

- Exterior/Interior Above Grade Walls
- Exterior/Interior Below Grade Walls
- Attic Insulation
- Re-siding Projects
- Slab on Grades
- Exterior Roof Decks
- Cathedral Ceilings
- Cavity Walls
- Radiant Floor Heating
- Snow Melts

1.3 – Product Availability

To meet your unique construction needs, we offer a broad range of products, both conventional and innovative, for every kind of building insulation application.

Envirosheet is available in compressive strengths of 12.5, 22.4 and 37.3 psi and SilveRboard is available in compressive strengths of 12.8, 21.5, 35.6 and 44.4 psi in both regular and shiplap joint. In addition, we can provide any special orders that you may require.



1.4 – Dimensions & Packaging

| | Size | |
|--------------|------------|----|
| SilveRboard® | 4'x8'x1" | 30 |
| SilveRboard® | 4'x8'x1.5" | 20 |
| Envirosheet® | 2'x8'x1" | 60 |
| Envirosheet® | 2'x8'x1.5" | 40 |

All bundles are wrapped in clear film packaging.

1.5 – Material Storage

SilveRboard® and Envirosheet® should be secured during storage and placement. The boards should also be covered with a light-colored opaque tarp if stored outdoors for longer than two weeks. EPS shall not be exposed to hydrocarbons or petroleum based solvents such as gasoline, diesel fuel, concrete curing compound, coal tar pitch and asphalt/mastic compounds.



Part 2 – Benefits & Incentives

2.1 – Maximizes Value

SilveRboard® and Envirosheet® are designed to maximize jobsite productivity. Both are quick and simple to install, lightweight yet durable, easy to cut and handle, provide a level surface for finishings and offer moisture resistance, providing lifelong performance.

EPS products such as SilveRboard® and Envirosheet® are an excellent choice for your projects since they offer the highest r-value per dollar over all other types of generic insulation. They can also be used for a variety of applications.

2.2 – Comfortable

Since both SilveRboard® and Envirosheet® are moisture resistant they can help to prevent the growth of mold and mildew. They can also help to improve indoor air quality since they reduce air infiltration which minimizes the amount of pollens and pollutants that enter the structure. In addition, the insulation will result in more consistent indoor air temperatures.

2.3 – Green

Placing rigid EPS insulation over the entire exterior of a building will provide a continuous insulation layer which eliminates thermal bridging, reduces air infiltration and isolates the structure from outdoor temperatures which maximizes heat and cooling efficiency.

All Amvic insulation products contain no CFCs or HCFCs or formaldehyde. The rigid closed cell structure of SilveRboard® and Envirosheet® insulation contain only air, making them safe choices for your home and the environment. In addition, any waste material can be recycled which reduces the impact on land fills.

2.4 – Green Building Credits

SilveRboard® and Envirosheet® may contribute credits towards achieving green building ratings for USGBC LEED, Green Globes, Model Green Building Guidelines and LEED Canada. For detailed information, please visit the EPS Molders Association website at <http://www.epsmolders.org/5F.html>.



2.5 – Canadian Retrofit Grants

2.5.1 – ecoENERGY Retrofit Grant

The ecoENERGY Retrofit Grant encourages homeowners to undertake retrofits which result in higher energy savings by rewarding property owners with a grant based on the recommended measures they adopt. To be eligible, you will need to invest a minimum of \$300 in retrofits. The more you do to reduce your home's energy consumption, the more you can expect to get back in the form of a retrofit grant to a maximum of \$5,000.

2.5.2 – Home Energy Retrofit Program

Ontarians eligible for an ecoENERGY grant will receive an identical amount from the provincial government through the province's Home Energy Retrofit Program. The province will also pay for half the cost of the first audit (up to a maximum of \$150). Separate applications are not necessary for the provincial rebate and retrofit grant. Ontario's Home Energy Retrofit Program will match the federal ecoENERGY grant dollar for dollar, increasing the maximum grant amount to \$10,000.

2.5.3 – Grant Amounts for Insulation

Green Communities Canada – ecoENERGY outlines the grant amounts available as a result of improved insulation in a home. Using SilverBoard® and Envirosheet® insulation can contribute from a minimum of \$680 to a maximum of \$3900 towards both the ecoENERGY Retrofit and Home Energy Retrofit grants. For more information, please visit http://egh.gca.ca/index.php?en_newincentives.



Part 3 – Technical Testing

3.1 – SilverBoard®

| Physical properties of SilverBoard® | | | | | | |
|-------------------------------------|-------------------------------------|----------------------------|----------------------------|-----------------------------|----------------------------|----------------------------|
| Standard | Description | Product designation | | | | |
| | | SB-12 | SB-21 | SB-35 | SB-44 | SB-35XS |
| ASTM D1622 | Density lb/ft ³ | 1.0 lb/ft ³ | 1.5 lb/ft ³ | 2.0 lb/ft ³ | 2.5 lb/ft ³ | 2.0 lb/ft ³ |
| | Density Kg/m ³ | 16.0 Kg/m ³ | 24.0 Kg/m ³ | 32.0 Kg/m ³ | 40.0 Kg/m ³ | 32.0 Kg/m ³ |
| ASTM C518 | R-Value/1-inch @75°F | 4.1 ft ² ·h·°F/ | 4.3 ft ² ·h·°F/ | 5.0 ft ² ·h·°F/ | 5.0 ft ² ·h·°F/ | 5.0 ft ² ·h·°F/ |
| | RSI/25mm @24°C | BTU | BTU | BTU | BTU | BTU |
| ASTM STP1320 | R-Value/1-inch @0°F | 5.2 ft ² ·h·°F/ | 5.5 ft ² ·h·°F/ | 6.0 ft ² ·h·°F/ | 6.0 ft ² ·h·°F/ | 6.0 ft ² ·h·°F/ |
| | RSI/25mm @-18°C | BTU | BTU | BTU | BTU | BTU |
| ASTM D1621 | Compressive strength at 10% strain | 12.8 psi | 21.5 psi | 35.6 psi | 44.4 psi | 35.6 psi |
| | | (88.2 kPa) | (147.9 kPa) | (245.5 kPa) | (306.1 kPa) | (245.5 kPa) |
| ASTM C203 | Flexural strength | 40.0 psi | 60.0 psi | 84.0 psi | 106.0 psi | 84.0 psi |
| | | (277.0 kPa) | (414.0 kPa) | (579.0 kPa) | (730.0 kPa) | (579.0 kPa) |
| ASTM C272 | Water absorption (% by volume) | 0.85% | 0.68% | 0.43% | 0.08% | 0.43% |
| ASTM E96 | Water vapor permeance | 12 ng/Pa.s.m ² | 8.6 ng/Pa.s.m ² | 4.27 ng/Pa.s.m ² | 1.6 ng/Pa.s.m ² | 217 ng/Pa.s.m ² |
| | | (0.21 perm) | (0.15 perm) | (0.075 perm) | (0.028 perm) | (3.48 perm) |
| ASTM D2126 | Dimensional Stability Linear change | -0.15% | -0.11% | -0.1% | -0.1% | -0.1% |
| ASTM D2863 | Limiting Oxygen Index | >24% | >24% | >24% | >24% | >24% |

| Surface burning characteristics of SilverBoard® in accordance with CAN/ULC-S102.2 | | | |
|---|------------------------------|--------------------------|-----------------|
| Material Details | | Classification or Rating | |
| Thickness (mm) | Density (Kg/m ³) | Flame Spread Index | Smoke Developed |
| 25-100 | 16 | 225 | 475 |
| 25 | 24 | 240 | 290 |
| 50 | 24 | 200 | 380 |
| 75 | 24 | 205 | 495 |
| 100 | 24 | 175 | over 500 |
| 25 | 32 | 220 | 265 |
| 50 | 32 | 180 | 450 |
| 75 | 32 | 165 | over 500 |
| 100 | 32 | 135 | 500 |
| 25-75 | 40 | 210 | over 500 |

| Surface burning characteristics of SilverBoard® in accordance with ASTM E84 (UL 723) | | |
|--|---------------------|---------------------|
| Density | 1.0 to 1.5 pcf | 2.0 pcf |
| Thickness (mm) | 0.5-inch to 4-inch+ | 0.5-inch to 4-inch+ |
| Flame Spread Index | 15* | 0* |
| Smoke Developed | 150-300* | 30* |

*Flame spread and smoke developed recorded while material remained in the original test position.



3.2 – Envirosheet®

| Physical Properties of Envirosheet® | | | | |
|-------------------------------------|-------------------------------------|--|---|---|
| Standard | Description | Product Designation | | |
| | | ES-12 | ES-22 | ES-37 |
| ASTM D1622 | Density lb/ft ³ | 1.0 lb/ft ³ | 1.4 lb/ft ³ | 2.0 lb/ft ³ |
| | Density Kg/m ³ | 16.0 Kg/m ³ | 22.0 Kg/m ³ | 32.0 Kg/m ³ |
| ASTM C518 | R-Value/1-inch @ 75°F | 3.7 ft ² ·h·°F/BTU | 4.0 ft ² ·h·°F/BTU | 4.3 ft ² ·h·°F/BTU |
| | RSI/25mm @ 24°C | 0.65 (m ² ·°K/W) | 0.70 (m ² ·°K/W) | 0.76 (m ² ·°K/W) |
| ASTM STP1320 | R-Value/1-inch @ 0°F | 4.6 ft ² ·h·°F/BTU | 4.8 ft ² ·h·°F/BTU | 5.0 ft ² ·h·°F/BTU |
| | RSI/25mm @ -18°C | 0.81 (m ² ·°K/W) | 0.84 (m ² ·°K/W) | 0.88 (m ² ·°K/W) |
| ASTM D1621 | Compressive strength at 10% strain | 12.5 psi (86.0 kPa) | 22.4 psi (154.6 kPa) | 37.3 psi (257.4 kPa) |
| ASTM C203 | Flexural strength | 27.8 psi (192.0 kPa) | 45.0 psi (310.0 kPa) | 63.2 psi (436.0 kPa) |
| ASTM D2842 | Water absorption (% by volume) | 3.8% | 1.87% | 1.57% |
| ASTM E96 | Water vapor permeance | 282.0 ng/Pa.s.m ² (4.95 perms) | 187.23 ng/Pa.s.m ² (3.29 perms) | 104.29 ng/Pa.s.m ² (1.83 perms) |
| ASTM D2126 | Dimensional Stability Linear change | -1.5% | -1.5% | -1.3% |
| ASTM D2863 | Limiting Oxygen Index | <24% | <24% | <24% |

| Surface Burning Characteristics of Envirosheet® in accordance with CAN/ULC-S102.2 | | | |
|---|------------------------------|--------------------------|-----------------|
| Material Details | | Classification or Rating | |
| Thickness (mm) | Density (Kg/m ³) | Flame Spread Index | Smoke Developed |
| 25 (Min) | 16 | 225 | 475 |
| 25 | 22 | 240 | 500 |
| 50 | 22 | 200 | 380 |
| 75 | 22 | 205 | 495 |
| 100 | 22 | 175 | Over 500 |
| 25-100 | 32 | 220 | Over 500 |

Expanded Polystyrene (EPS) is a combustible material. When tested in accordance with CAN/ULC S102.2, combustible material of greater density or increased thickness will increase fuel loading and hence increase the measured flame spread ratings



4.7 – Attic Insulation

For this application, Type 1 SilverBoard® is recommended.

Step 1: Insulate the Ceiling

Fasten SilverBoard® directly to the underside of the roof trusses/rafter. In order to obtain the benefits of a radiant barrier with SilverBoard®, you must install it with a minimum of a $\frac{3}{4}$ inch air space between other building materials. In this case, install furring strips on top of the insulation every 16 inches or 24 inches o/c and fasten sheetrock to the strapping (make sure there is proper air spacing around any pot lights etc.). As with any radiant barrier application, careful selection of the positioning of the air space to minimize the accumulation of dust and debris on the laminate will ensure optimum performance.

For installation without the benefit of a radiant barrier, install the sheetrock directly over top of the SilverBoard® using longer screws.

Step 2: Insulate the Door or Hatch Cover

Cut to the same dimensions as the hatch cover two or more pieces of $\frac{3}{4}$ inch SilverBoard®. If the cover is plywood, use ringed-shank nails with a flat metal washer placed under the head to fasten the insulation to it. If the cover is wallboard or hardboard, glue the insulation instead.

If the opening to the attic consists merely of a hatchway covered by a removable piece of plywood or wallboard, you can insulate it simply by attaching SilverBoard® to the back of the piece and adding a narrow border of adhesive-backed foam weather-stripping around the perimeter of the side facing the living area.



4.8 – Interior Slab on Grade or Basement Floor

For this application, SilverBoard® for Concrete is recommended and should be installed with the non-reflective side against the fresh concrete.

There are several ways to install sub floor strapping and insulation. Amvic recommends that 2x2 strapping and insulation are installed in sequence, by installing a row of strapping followed by a row of insulation and so on, until the surface is completely covered. The strapping must be placed every 2ft on centre in one direction across the floor to ensure that the sub floor will be secured properly.

Step 1: Cover the Floor with a Moisture Barrier

Cover the entire concrete floor with a 6 mil polyethylene moisture barrier and tape all seams to prevent moisture leakage.

Step 2: Install Perimeter Sub Floor Strapping

Install strapping around the entire perimeter of the floor using self tapping concrete screws or concrete nails.

Step 3: Install the First Row of Insulation and Strapping

Cut the first row of insulation to a 21³/₄ inch width and install it against the longest straight wall. Install the first row of strapping against the insulation, in the same manner as the perimeter strapping.

Alternative Method:

Install strapping entirely first, then cut and fit the insulation.

Step 4: Install Remaining Sub Floor Strapping and Insulation

Cut the remaining rows of insulation to 22¹/₂ inch widths and begin installing them one row at a time, followed by a row of strapping. Measure each row from the inside edge of the previous row to the inside edge of the new row, to ensure that the strapping is located every 2ft on center.



Step 5: Install Sub Floor

Before installing the sub floor, mark the locations of the strapping on the walls to simplify installation of the sub floor. Install the sub floor.

Alternative Method:

After placing the moisture barrier, place the insulation, tape seams and then lay $\frac{5}{8}$ or $\frac{3}{4}$ inch t&g sheeting ovetop with glue adhesive and/or concrete screw or nail through the sheeting directly to the concrete floor.



4.9 – Radiant Floor Heating

For this application, SilveRboard® for Concrete is recommended and should be installed with the non-reflective side against the fresh concrete.

Step 1: Cover the Fill with a Moisture Barrier

Place and level a 6 inch thick layer of granular fill over the entire floor surface area, then cover it with a 6 mil polyethylene moisture barrier (Not required if using SilveRboard®). Tape all seams to prevent moisture leakage.

Step 2: Place Insulation

Starting from a corner, install the insulation boards to the wall with an adhesive that is compatible for use with EPS (follow the manufacturer's instructions for use). The distance between joints should not be greater than 1 mm. To ensure this, also use adhesive to secure the boards together.

Step 3: Install Hydronic Tubing

If the radiant floor heating will be installed in a non-structural slab, install 6x6 wire mesh before installing the hydronic tubing. Next, lay the tubing as per the manufacturer's directions and tie it to the wire mesh using nylon zip-ties as per design specifications.

Step 4: Install Reinforcement

Support the required concrete reinforcing material over the insulation at the height required.

Step 5: Pour the slab

Pour the concrete over the insulation using normal construction methods and equipment.



Part 5 – Amvic SilveRboard XS- Exterior Wall sheathing

Installation Details:

5.1-Board Placement (over OSB/ Aspenite)

Measure vertical height and horizontal width before starting each wall facing, to determine best panel layout. Sheathing panels can be applied either vertically (preferable in tall wall applications to reduce the number of possible taped joints) or horizontally, to minimise the number of joints and reduce overall cutting and waste.

Start at a bottom – front (of the home) corner with a full panel whenever possible,

Start from the bottom of the wall with full panels, leaving cuts and joints on the upper part of the wall.

5.2-Board Placement (over open stud assembly; with corner and/or wind-bracing)

Measure vertical height and horizontal width before starting each wall facing to determine best panel layout. Sheathing panels can be applied either vertically (preferable in tall wall applications to reduce the number of possible taped joints) or horizontally, to minimise the number of joints and reduce overall cutting and waste.

Start at a bottom – front (of the home) corner with a full panel whenever possible,

Start from the bottom of the wall with full panels, leaving cuts and joints on the upper part of the wall.

If using OSB or Plywood corner bracing panels use full sheets to cover both the reinforcing panels and the first 1 or 2 vertical studs for a continuous thermal break where it is most needed(at the corners).

NOTE: If you are using this method for siding application, furring strips will need to be applied to the studs to flush the wall with the



corner, or the corner bracing must be recessed to allow for a smooth straight wall transition.

5.3-Fasteners (over OSB/ Aspenite)

Fasten SilverBoard XS[®] directly to the face of the OSB / Aspenite wall facing where applicable with either cap nails, cap screws or cap staples (allow for a minimum of 1.5" of fastener length, over and above the total thickness of your insulation panel plus the structural or OSB (Example - 1" SilverBoard + 7/16" OSB +1.5" = 2 15/16" nail, staple or screw)

Your mechanical fasteners should be no more than 18" apart around the outside edge of the boards (Brick-ties also qualify as fasteners so do not duplicate). Since sheets are 4ft x 8ft, fasteners are only recommended every 24" o/c on the center studs for stability (Use the printed guidelines on the board to locate studs under the board.) It is also recommended that the fasteners be at least 1" in from edges or corners to prevent product tearing.

5.4- Fasteners (over open stud assembly; with corner and/or wind-bracing)

Fasten SilverBoard XS[®] directly to the studs wherever possible with either cap nails, cap screws or cap staples (allow for a minimum of 1.5" of fastener length, over and above the total thickness of your insulation panel (Example - 1" SilverBoard +1.5" = 2.5" nail , staple or screw)

Your mechanical fasteners should be no more than 12 - 15" apart around the outside edge of the boards (Brick -ties also qualify as fasteners so do not duplicate). Since sheets are 4ft x 8ft, fasteners are recommended every 18" o/c on the center studs for stability (Use the printed guidelines on the board to locate studs under the board.) It is also recommended that the fasteners be at least 1" in from edges or corners to prevent product tearing.



5.5-Radiant Barrier Benefits

In order to obtain the maximum benefits of a radiant barrier with SilverBoard®, you must install it with a minimum of a 3/4 inch air space (between the board and other building materials in the wall assembly to prevent contact, and minimize thermal conduction - Brick, OSB or Siding).

For siding applications; To achieve this spacing on one or both sides install 3/4"-1" metal or wood furring strips before installing the SilverBoard® (on the OSB side), and then on top of the insulation panel every 16 inches or 24 inches o/c - fasten the siding to the strapping .

For installation (without the benefit of a radiant barrier), install the siding directly over top of the SilverBoard® using longer screws.

For Brick or Stone applications; to achieve this spacing against the OSB install 3/4" - 1" metal or wood furring strips before installing the SilverBoard®.

Attach the brick -ties on top of the insulation and into the studs every 16 inches or 24 inches o/c this automatically gives you the air space on the outside face of the insulation board.

5.6-Joint Taping and Sealing

Due to the unique breathable nature of the micro-perforated **SilverBoard® XS Exterior Wall Sheathing** we recommended that you use 3" standard tuck tape, to tape all board and corner joints. This will provide for a continuous air / vapour barrier around the house/ building.

Taping in this manner eliminates the need for additional application of any type of house wrap.



NOTE:

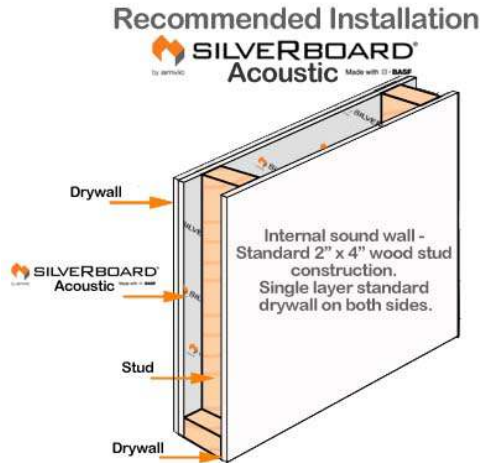
-Special care should be taken to tape around all window /door and vent openings with either regular Tuck Tape or Blue Skin type products, to eliminate the possibility of moisture or water entering into the inner wall assembly through these joints.

-Large Edge Gaps: Care should be taken to adequately seal all gaps greater than $\frac{3}{4}$ " wide with spray foam, or wedge in and tape SB board off-cuts. This is to both seal the gap from air and moisture, and allows the sheathing to maintain its optimum R value, especially on corners and around doors, windows and vent/ pipe penetrations.



Part 6 – SilverBoard Acoustic

6.1 – SilverBoard Acoustic Installation



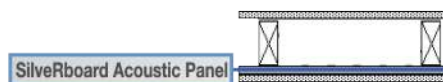
SilverBoard Acoustic is a rigid flat-sheet insulation board that offers dramatic sound control properties up to IIC 70 coupled with radiant barrier (heat reflecting) properties and R5.6 insulation for use in residential, low rise, apartments and townhouses or high-rise residential or commercial. SilverBoard Acoustic increases jobsite efficiency and reduces labor costs.

6.2 – Product Applications

- Walls, floors and ceilings.
- Bathrooms / Laundry rooms.
- Theater and quiet rooms.

6.3 – Single Wall Assembly Installation – STC 19 - IIC 70

Internal or External* sound wall - Standard 2" x 4" wood stud construction
1 x Single layer standard 5/8" drywall on both sides without standard fiberglass batts or * 1 x Single layer standard 1/2" or 5/8" drywall on inside face with 7/16" OSB behind eternal surface sheathing (any type-Brick or siding).



| | |
|--|---|
| STC rating without SilverBoard Acoustic - 32-36 | STC rating WITH SilverBoard Acoustic - 51 - 55 |
|--|---|



Part 7 – Warranty

7.1 – 20 Year Limited Thermal Warranty

Amvic supports building owners, designers and contractors by offering a 20-year, limited thermal warranty on SilveRboard® and EnviroSheet®. This warranty is available to the building owner at the time the building is completed and is transferable to any subsequent owner during the 20-year period.



Preface

SilveRboard® and Envirosheet® are high quality, innovative insulation materials designed for both residential and commercial applications. Competitive pricing, extensive product distribution and excellent technical support are combined to provide our clients with a simplified approach to a superior finished product.

If any of your questions or concerns are not completely addressed in this manual, please contact us and our staff will be happy to answer your questions. At Amvic, we pride ourselves in offering our customers an exceptional level of customer service.

Technical Support:

Please contact us for any inquiries pertaining to information included in this manual, or if you require any other technical assistance.

Technical Support 1 (877) 470-9991 (toll free)
1 (416) 410-5674 ext. 129

Amvic Website

The Amvic website is updated regularly with the most current news, including testing reports, technical bulletins and evaluation reports. This technical and installation manual is posted on the website.

Amvic website – www.amvicsystem.com



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This manual provides a basic guide for the installation of SilveRboard® and Envirosheet® and is intended to supplement, rather than replace, the basic construction knowledge of the construction professional. All installations of SilveRboard® and Envirosheet® must be in accordance with all applicable building codes and/or under the guidance of a licensed professional engineer. In all cases, applicable building code regulations take precedence over this manual.

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