

(Specifier Note: The purpose of this guide specification is to assist the specifier in correctly specifying SILVERBOARD insulation and execution. The specifier needs to edit the guide specifications to fit the needs of specific projects. Contact an AMVIC Product Representative to assist in making the appropriate product selections. Throughout the guide specification, there are Specifier notes to assist in the editing of the file.

SECTION 07 21 13

Board Insulation

PART 1 GENERAL

1.01 SUMMARY

- A. Comply with the requirements for Division 1 – General Requirements.
- B. Supply and installation of SilveRboard® insulation for below grade & above grade walls, exterior or interior of wall assemblies, underside of slab on grade and roof decking.

1.02 WORK SCOPE

- A. Furnish all labor, materials, tools and equipment to perform the installation of SILVERBOARD as manufactured by **AMVIC INC.** 501 McNicoll Avenue, Toronto, Ontario, M2H 2E2, Canada (416) 410-5674 / (877) 470-9991.

1.03 PRODUCTS INSTALLED BUT NOT SPECIFIED OR SUPPLIED UNDER THIS SECTION

- A. All screws and fasteners
- B. Tape for joining SilveRboard® sheets
- C. Penetrations

1.04 RELATED SECTIONS

(Specifier Note: ADD/DELETE/MODIFY the Section Numbers and Titles to correspond with specific project requirements. Related Sections to be added may include exterior wall finish, doors and window specific to project)

- A. Section 06 00 00 – Woods and Plastics
- B. Section 07 10 00 – Damp-proofing and Waterproofing
- C. Section 07 11 00 – Damp-proofing
- D. Section 07 13 00 – Sheet Waterproofing
- E. Section 07 24 00 – Exterior Insulation and Finish System
- F. Section 07 46 00 – Siding
- G. Section 07 60 00 – Flashing and sheet Metal
- H. Section 08 00 00 – Doors and Windows
- I. Section 09 20 00 – Plaster and Gypsum Board
- J. Section 09 70 00 – Wall Finishes

1.05 REFERENCES

(Specifier Note: ADD/DELETE/MODIFY the Standards and references to correspond to the specific requirements and geographic location of the project.)

- A. Underwriters' Laboratories Canada (CAN/ULC)
 - 1. CAN/ULC S701-05 – Standard for Thermal Insulation, Polystyrene, Boards and Pipe Covering.
 - 2. CAN/ULC S102.2 – Standard Method of Test for Surface Burning Characteristics of Flooring, Floor Covering and Miscellaneous Materials
- B. American Society for Testing and Materials (ASTM)
 - 1. ASTM C578-07 – Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation.
 - 2. ASTM E84-07 – Standard Test Method for Surface Burning Characteristics of Building Materials

1.06 SYSTEM DESCRIPTION

- A. SilveRboard® is rigid flat sheet insulation material made from expanded polystyrene (EPS). The flat sheet is laminated with a silvery, reflective layer of polypropylene on each side
- B. SilveRboard® is available in the following nominal densities depending on the application: 1 pcf (16 kg/m³), 1.5 pcf (24 kg/m³), 2 pcf (32 kg/m³), 2.5 pcf (40 kg/m³)
- C. SilveRboard® rigid flat insulation sheets have thicknesses ranging from ¾" (19.05 mm) to 6" (100 mm). The standard dimensions of the sheets are:
 - 4' x 8' (1.22 m x 2.44 m)
 - 4' x 9' (1.22 m x 2.74 m)
 - 4' x 10' (1.22 m x 3.04 m)
 - 2' x 8' (.6m x 2.44m)

1.07 SUBMITTALS

(Specifier Note: ADD/DELETE/MODIFY the Section Numbers and Titles to correspond with specific project requirements)

- A. Conform to requirements of Section 01 33 00 Submittal Procedures and Section 01 78 00 Closeout Submittals.
- B. Product Data: Submit manufacturer's literature describing products, installation procedures.
- C. Shop Drawings: Submit drawings indicating dimensions, layout, and details.
- D. Test and Legacy Reports: When requested, submit test reports to support performance requirements specified and Legacy report approvals from (ICC), (CCMC – Canada), as required.

1.08 QUALITY ASSURANCE

A. Qualifications

1. Installer Qualifications: Installer shall have a minimum of 3 years experience in the installation of rigid board insulation and demonstrated experience with scope of work and scale equivalent to the project.

B. Pre-installation Meetings

1. Prior to starting SilveRboard® insulation, convene meeting at project site. Include trades responsible for installing boards, and other trades responsible for installing work that requires penetrating through the insulation sheets.

C. Certifications

1. Manufacturer's signed certification that product meets the requirement of this section.

1.09 DELIVERY, STORAGE AND HANDLING

A. Deliver the product in original factory packaging with product listing label and manufacturing label.

B. Store materials in manufacturer provided bundles, to prevent damage. Protect from extended exposure to direct sunlight.

C. Handle and store product in a location to prevent physical damage and soiling.

D. Store product off ground and protected from direct sunlight and harmful weather conditions.

E. SilveRboard® is a combustible product and shall not be exposed to a continuous fire source.

F. Keep SilveRboard® away from petroleum products as these is likely to soften, dissolve or deteriorate the product.

1.10 WARRANTY

A. Contact AMVIC for a written copy of product warranty, OR

B. Refer to requirements of the project contract for warranty provisions.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. AMVIC Building System
 501 McNicoll Avenue,
 Toronto, Ontario, M2H 2E2
 Canada
 Tel: 416-759-7402 / 1-877-470-9991
 www.amvicsystem.com

2.02 Material Specifications

(Specifier Note: Sections A and B are for Canada only and sections C and D are for the United States. Please delete sections not appropriate or applicable to project as necessary.)

A. Physical Properties

Physical Properties of SilverBoard®						
		Product Designation				
Standard	Description	SB-12	SB-21	SB-35	SB-44	SB-35XS
ASTM D1622	Density lb/ft³ Density Kg/m³	1.0 lb/ft³ 16.0 Kg/m³	1.5 lb/ft³ 24.0 Kg/m³	2.0 lb/ft³ 32.0 Kg/m³	2.5 lb/ft³ 40.0 Kg/m³	2.0 lb/ft³ 32.0 Kg/m³
ASTM C518	R-Value/1-inch @ 75°F RSI/25mm @ 24°C	4.1 ft²•h•°F/BTU 0.72 (m²•°K/W)	4.3 ft²•h•°F/BTU 0.76 (m²•°K/W)	5.0 ft²•h•°F/BTU 0.88 (m²•°K/W)	5.0 ft²•h•°F/BTU 0.88 (m²•°K/W)	5.0 ft²•h•°F/BTU 0.88 (m²•°K/W)
ASTM STP1320	R-Value/1-inch @ 0°F RSI/25mm @ -18°C	5.2 ft²•h•°F/BTU 0.91 (m²•°K/W)	5.5 ft²•h•°F/BTU 0.96 (m²•°K/W)	6.0 ft²•h•°F/BTU 1.05 (m²•°K/W)	6.0 ft²•h•°F/BTU 1.05 (m²•°K/W)	6.0 ft²•h•°F/BTU 1.05 (m²•°K/W)
ASTM D1621	Compressive strength at 10% strain	12.8 psi (88.2 kPa)	21.5 psi (147.9 kPa)	35.6 psi (245.5 kPa)	44.4 psi (306.1 kPa)	35.6 psi (245.5 kPa)
ASTM C203	Flexural strength	40.0 psi (277.0 kPa)	60.0 psi (414.0 kPa)	84.0 psi (579.0 kPa)	106.0 psi (730.0 kPa)	84.0 psi (579.0 kPa)
ASTM D2842	Water absorption (% by volume)	0.85%	0.68%	0.43%	0.075%	0.43%
ASTM E96	Water vapor permeance	12 ng/Pa.s.m2 (0.21 perm)	8.6 ng/Pa.s.m2 (0.15 perm)	4.27 ng/Pa.s.m2 (0.075 perm)	1.6 ng/Pa.s.m2 (0.028 perm)	217 ng/Pa.s.m2 (3.48 perm)
ASTM D2126	Dimensional Stability Linear change	-0.147%	-0.108%	-0.1%	-0.1%	-0.1%
ASTM D2863	Limiting Oxygen Index	>24%	>24%	>24%	>24%	>24%
ASTM E2178-11	Standard test Method for Air Permeance of Building Materials					0.01 L/s.m2 @ 75 pa *

B. Surface Burning Characteristics

Surface Burning Characteristics in Accordance with CAN/ULC-S102.2			
Material Details		Classification or Rating	
Thickness (mm)	Density Kg/m3	Flame Spread	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

C. Surface Burning Characteristics

Surface Burning Characteristics in accordance with UL 723				
	1.0 pcf	1.0 pcf	1.5 pcf	1.5 pcf
	3/4 inch thickness	4 inch thickness	3/4 inch thickness	4 inch thickness
Flame Spread Index	0	0	0	0
Smoke Developed Index	90	400	350	450

(Specifier Note: DELETE units not appropriate for use on specific project)

2.03 ACCESSORIES

- A. Tape
- B. Screws and/or nails
- C. Washers
- D. Caulking
- E. Markers
- F. EPS Compatible Adhesive

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify Site Conditions
- B. Verify that substrate, any adjacent materials and SilverBoard® sheets are dry.

- C. Verify that substrate material is flat and free of protrusions, irregularities and other materials or substances that may damage the SilverBoard® and prevent proper installation.

3.02 Workmanship

- A. Installation shall be installed so as to provide a continuous thermal protection layer to the building elements it is applied on.
- B. SilverBoard® shall have a minimum of 3" (75 mm) space from heat emitting devices such as light fixtures and a minimum of 2" (50 mm) chimneys and vents.
- C. Cut and trim SilverBoard® sheets to fit tightly in spaces. Install the sheets horizontally or vertically depending on preference and application.
- D. Butt joints between SilverBoard® sheets tightly and offset vertical and horizontal joints.
- E. Cover vertical and horizontal butt joints with tape and flash properly around penetrations and wall openings to reduce any thermal bridge effects.

3.03 INSTALLATION – GENERAL

SilverBoard® shall be installed as per the manufacturer's instructions and technical manual.

A. Exterior Above Grade Walls

Step 1: Measure and Fit

Begin by measuring and cutting any insulation that will be required to fit openings using a utility knife or a handsaw (keyhole or drywall). Install boards with the distance between joints less than 1 mm and all vertical joints located directly on the studs.

Step 2: Install Insulation

When attaching the insulation, the head or washer size will vary depending on the cladding that will be used. If the new cladding will be applied directly to the insulation, use fasteners with heads or washers which are at least ½" in diameter. In order to obtain the benefits of a radiant barrier with SilverBoard®, you must install it with a minimum ¾" air space between it and other building materials. In this case, use appropriate nail fasteners and install furring strips on top of the insulation every 16" or 24" o/c and fasten finishing to the strapping.

Step 3: Attach New Cladding

Finally, attach the new cladding. If nails or screws are required to attach the cladding materials, they must penetrate through the insulation and be secured into the framing.

B. Exterior Below Grade Walls

Step 1: Apply Dampproofing

First make sure that concrete wall surface is clean, dry and free of debris. Apply a Damp-proofing or water-proofing system, to the exterior face of concrete wall from the top of footings to above finished grade.

Step 2: Measure & Trim

Measure and cut any insulation that will be required to fit openings using a utility knife or a handsaw (keyhole or drywall).

Step 3: Attach Insulation

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

Step 4: Protect Insulation

Place a 6'' deep layer of coarse gravel against the bottom edge of the insulation and over the drainage tile. The insulation must be protected from the top of the basement wall to 12'' below grade to prevent damage. Stucco parging is one common protective layer than may be applied. Talk to your building supply professional about other choices.

Step 5 - Backfill

Backfill as per the local building code requirements.

C. Interior Below Grade Walls

Step 1: Prepare the Wall

Prepare the wall by removing all protrusions. The entire wall surface must be relatively smooth, clean and dry before proceeding.

Step 2: Measure and Fit

Begin by measuring and cutting any insulation that will be required to fit openings using a utility knife or a handsaw (keyhole or drywall).

Step 3: Attach 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 4: Construct a Frame Wall to Attach the Finish

Construct a separate 2x2 wood stud frame wall or light gauge steel frame wall. Install the framed wall in front of the insulation by attaching it to the upper floor joists and basement floor, leaving a small gap between the insulation and the back of the frame wall. Install electrical wiring within the frame wall. Finish by installing ½" gypsum board to the frame wall.

D. Attic Insulation

Step 1: Insulate the Ceiling

Fasten SilverBoard® directly to the underside of the roof trusses/rafters. In order to obtain the benefits of a radiant barrier with SilverBoard®, you must install it with a minimum of a ¾" air space between other building materials. In this case, install furring strips on top of the insulation every 16" or 24" 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 ¾" 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.

E. Interior Slab on Grade or Basement Floor

For this application, SilverBoard® 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 six-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 21 ¾" 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 22 ½" 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 5/8 or 3/4 t&g sheeting ovetop with glue adhesive and/or concrete screw or nail through the sheeting directly to the concrete floor.

F. Radiant Floor Heating

For this application, SilveRboard® is installed with the non-reflective side against the fresh concrete.

Step 1: Cover the Fill with a Moisture Barrier

Place and level a 6" 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.

G. Roof and Deck Insulation

For this application, SilveRboard® should be installed with the non-reflective side up.

Examine roof deck for suitability to receive insulation. Verify that substrate is dry, clean and free of foreign material that will damage insulation or impede installation.

Verify that roof drains, scuppers, roof curbs, fasteners, equipment supports, vents and other roof accessories are secured properly and installed in conformance with contract drawings and submittals.

Step 1:

Verify need for a vapor barrier. When required, insert installation requirements of vapor barrier manufacturer.

Step 2:

Verify that deck is structurally sound to support installers, materials and equipment without damaging or deforming work.

Step 3:

Install specified insulation using approved mechanical fasteners, hot asphalt, adhesives in accordance with the manufacturer's latest written instructions and as required by governing codes and owner's insurance carrier.

Install with end joints staggered to avoid having insulation joints coinciding with joints coinciding with joints in deck. In multi-layer installations, stagger joints in top and bottom layers.

3.04 FIELD QUALITY CONTROL

- A. SilveRboard® product labeling shall be inspected prior to being installed in order to make sure it complies with applicable code standards and regulations.
- B. If SilveRboard® is received damaged or broken then return to manufacturer for recycling.

- C. Installed SilveRboard® product shall be inspected to ensure all butt joints are staggered, taped and there are no breaks in the thermal barrier.
- D. Remove damaged SilveRboard® that has been installed and replace with new undamaged product.

3.05 CLEANING

- A. Ensure construction debris is removed from SilveRboard® or substrate surfaces prior to installation
- B. Do not leave SilveRboard® insulation exposed to weather for more than 45 days. Use protective covering if cladding will be installed later than this period.
- C. Remove any cut SilveRboard® debris from the jobsite and recycle.

END OF SECTION