



Submittal Review Response

Project Name: *Hilo WWTP Rehabilitation and Replacement Project Phase 1*
Submittal No.: *07210-001.0*
Date: *9/5/2025*

Client: County of Hawai'i Carollo Project No.: 203975
Contractor: Nan, Inc.
Submittal Name: Building Insulation
Reviewed By: Engineering Partners – Brian Funai

SUBMITTAL REVIEW

Review is for general compliance with contract documents. No responsibility is assumed by Carollo for correctness of quantities, dimensions, and details. No deviation or variation is approved unless specifically addressed in these review comments. Refer to Section 01330 for additional requirements. The Contractor shall assume full responsibility for coordination with all other trades and deviations from contract requirements.

Approved	<input checked="" type="checkbox"/> No Exceptions
	<input type="checkbox"/> Make Corrections Noted - See Comments
	<input type="checkbox"/> Make Corrections Noted - Confirm
Not Approved	<input type="checkbox"/> Correct and Resubmit
	<input type="checkbox"/> Rejected - See Remarks
Receipt Acknowledged	<input type="checkbox"/> Filed for Record
	<input type="checkbox"/> With Comments - Resubmit

Review Comments:

1. See attached submittal with review stamp.

High Priority

CONTRACTOR SUBMITTAL TRANSMITTAL FORM REV. A

Owner: County of Hawaii
Contractor: Nan, Inc.
Project Name: Hilo WWTP Phase 1
Submittal Title:
TO:
From: Nan Inc.

Project No.: WW-4705R
Submittal Number:
For Information Only

Specification No. and Subject of Submittal / Equipment Supplier	
Spec:	Paragraph:
Authored By:	Date Submitted:

Submittal Certification	
Check Either (A) or (B):	
<input type="checkbox"/> (A)	We have verified that the equipment or material contained in this submittal meets all the requirements specified in the project manual or shown on the contract drawings with <u>no exceptions</u> .
<input type="checkbox"/> (B)	We have verified that the equipment or material contained in this submittal meets all the requirements specified in the project manual or shown on the contract drawings <u>except</u> for the deviations listed.
Certification Statement: By this submittal, I hereby represent that I have determined and verified all field measurements, field construction criteria, materials, dimensions, catalog numbers and similar data, and I have checked and coordinated each item with other applicable approved shop drawings and all Contract requirements.	

General Contractor's Reviewer's Signature:		
Printed Name and Title: In the event, Contractor believes the Submittal response does or will cause a change to the requirements of the Contract, Contractor shall immediately give written notice stating that Contractor considers the response to be a Change Order.		
Firm:	Signature:	Date Returned:

PM/CM Office Use		
Date Received GC to PM/CM:		
Date Received PM/CM to Reviewer:		
Date Received Reviewer to PM/CM:		
Date Sent PM/CM to GC:		

Nan, Inc
PROJECT: HILO WWTP REHABILITATION AND REPLACEMENT PROJECT - PHASE 1
JOB NO. WW-4705R
THIS SUBMITTAL HAS BEEN CHECKED BY THIS CONTRACTOR. IT IS CERTIFIED CORRECT, COMPLETE, AND IN COMPLIANCE WITH CONTRACT DRAWINGS AND SPECIFICATIONS. ALL AFFECTED CONTRACTORS AND SUPPLIERS ARE AWARE OF, AND WILL INTEGRATE THIS SUBMITTAL (UPON APPROVAL) INTO THEIR OWN WORK.

DATE RECEIVED _____
SPECIFICATION SECTION # _____
SPECIFICATION _____
PARAGRAPH _____
DRAWING _____
SUBCONTRACTOR _____
SUPPLIER _____
MANUFACTURER _____

CERTIFIED BY CQCM or Designee : _____

<input checked="" type="checkbox"/>	REVIEWED WITH REMARKS	AMEND AND RESUBMIT
<input checked="" type="checkbox"/>	NO EXCEPTIONS TAKEN	REJECTED
Corrections or comments made on the shop drawings during the review do not relieve the contractor from compliance to the requirements of the drawings and specifications. This check is only for review of general conformance with the design concept of the project and general compliance with the information given in the contract documents. The contractor is responsible for confirming and correlating all quantities and dimensions, selecting fabrication processes and techniques of construction and performing its work in a safe manner.		
ENGINEERING PARTNERS 455 E. LANIKAU LA ST HILO, HI 96720		
Check By: BRIAN F. FUNAI		
Received Date: 8/27/25	Reviewed Date: 9/4/25	

Remarks:

NEW SECTION

SECTION 07210^{AD3}

BUILDING INSULATION

PART 1 GENERAL

1.01 SUMMARY

- A. Extent of building insulation work is shown on the drawings, by the generic name; and types of building insulation include:
 - 1. Thermal and acoustical batt insulation for walls and partitions.
- B. Related Work Specified in other Sections:
 - 1. Section 09250 – Gypsum Wallboard
 - 2. Section 13120 – Pre-engineered Structures

1.02 QUALITY ASSURANCE

- A. Thermal Resistivity: Where thermal resistivity properties of insulation materials are designated by "R"-values they represent the rate of heat flow through a homogenous material exactly 1-inch thick, measured by test method included in referenced material standard or otherwise indicated. They are expressed by the temperature difference in degrees F between the two exposed faces required to cause one BTU to flow through one square foot per hour at mean temperatures indicated.
- B. Fire and Insurance Ratings: Provide insulation materials which are identical to those whose fire performance characteristics, as listed for each material or assembly of which insulation is a part, have been determined by testing, per methods indicated below, by UL or other testing and inspecting agency acceptable to authorities having jurisdiction.
 - 1. Surface Burning Characteristics: ASTM E 84.
 - 2. Fire Resistance Ratings: ASTM E 119.
 - 3. Combustion Characteristics: ASTM E 136.
- C. Recycled Materials: Provide insulation containing recycled materials to the extent practicable, provided the materials meets all other requirements of this section. The minimum required recycled materials content by weight are:
 - 1. Rock Wool: 75-percent slag
 - 2. Fiberglass: 20 to 25-percent glass cullet

1.03 SUBMITTALS

Data- Page(9-45)

- ✓ A. Submit in accordance with Section 01330 – Submittal Procedures.
- ✓ B. Manufacturer's Data: Submit manufacturer's specifications and installation instructions for types of insulation required. Include data substantiating that materials comply with specified requirements.

Installation- Page(46-54)

- ✓ C. Material Safety Data Sheets (MSDS): Submit MSDS for each material

1.04 SAFETY PRECAUTIONS

- A. Respirators and Other Concerns: Comply with OSHA 29 CFR 1910.134, "Respiratory Protection", ASTM C 930, "Potential Health and Safety Concerns Associated with Thermal Insulation Materials and Accessories", and other Federal, State, and local regulations governing safety. Provide workers with dust/mist respirators, training in their use, and protective clothing as approved by the National Institute for Occupational Safety and Health (NIOSH)/Mine Safety and Health Administration (MSHA).
- B. Open Flame: Do not use open flame around insulation materials.
- C. Do not use unfaced insulation in exposed applications where there is potential for skin contact and irritation.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Delivery: Deliver materials to site in original sealed wrapping bearing manufacturer's name and brand designation, specification number, type, grade, R-value, and class. Store and handle to protect from damage. Do not allow insulation materials to become wet, soiled or crushed. Comply with manufacturer's recommendations for handling, storing, and protecting of materials before and during installation.
- B. Storage: Inspect materials delivered to the site for damage; unload and store out of weather in manufacturer's original packaging. Store only in dry locations, not subject to open flames or sparks, and easily accessible for inspection and handling.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Thermal and Acoustical Batt Insulation for Walls: ASTM C 665, Type I, unfaced, flame spread of 25 or less and a smoke developed rating of 150 or less when tested in accordance with the procedures of ASTM E 84, R = 13 minimum. Provide widths as necessary to snugly fit framing spacing as indicated.
- B. Thermal Batt Insulation for installation above and in between steel roof framing: R = 30 minimum.
 - 1. Complies with ASTM C991 Type 1.
 - 2. Complies with NAIMA 202-96-REV 2000.
 - 3. Flame Spread Index <25 and Smoke Developed Index <50 when tested in accordance with ASTM E84, NFPA 255 and UL 723.
- C. Fabric liner facing/vapor barrier composed of woven high-density polyethylene coated on both sides with polyethylene. Complies with the following:
 - 1. ASTM C1136, Types I through Type VI
 - 2. Perm rating: ≤ 0.02 when tested in accordance with ASTM E 96 Procedure A.

- 3. Flame Spread Index < 25 and Smoke Developed Index < 50 when tested in accordance with ASTM E 84.
 - 4. Color: white
- D. Vapor barrier adhesive. Complies with the following:
- 1. Application temperature 10°F to 110° F.
- E. Double sided vapor barrier tape. Complies with the following:
- 1. Width 0.75-inches.
 - 2. Rubber based and free film
- F. Patch tape. Complies with the following:
- 1. Adhesive added to one side.
 - 2. Installation temperature from 10°F to 110°F.
 - 3. 3-inches width.
- G. Metal Banding/Straps. Complies with the following:
- 1. Coated steel
 - 2. 1-inch wide.
 - 3. Structural Steel Grade 50 per ASTM C 653.
 - 4. Exposed color to match vapor barrier.
 - 5. Backing: gray
- H. Thermal breaks:
- 1. Closed cell polyethylene foam tape for wall applications:
 - a. 0.125-inch thick to 0.375-inch thick.
 - b. 3-inches wide.
 - 2. Thermal spacer blocks:
 - a. Extruded or expanded polystyrene
 - b. Minimum width 3-inches
 - c. Thickness 0.5-inch to 1-inch.
- I. Light gage steel fasteners
- 1. Zinc plated cold forged steel.
 - 2. Head color to match vapor barrier.
 - 3. Contain rubber sealing washer.
- J. Heavy gage steel fasteners
- 1. Zinc plated cold forged steel.
 - 2. Head color to match vapor barrier.
 - 3. Contain rubber sealing washer.

2.02 ACCESSORIES

- A. Mechanical Fasteners: Corrosion resistant fasteners as recommended by the insulation manufacturer.

PART 3 EXECUTION

✓ 3.01 INSTALLATION

- A. General:
 - 1. Comply with manufacturer's instructions for the particular conditions of installation in each case. If printed instructions are not available or do not apply to the project conditions, consult the manufacturer's technical representative for specified recommendations before proceeding with the work.
 - 2. Extend roof and wall insulation full thickness as shown over entire area to be insulated. Cut and fit tightly around obstructions, and fill voids with insulation. Remove projections which interfere with placement.
 - 3. Apply a single layer of insulation of the required thickness, unless otherwise shown or required to make up the total thickness.
 - 4. Insulation shall be installed after construction has advanced to a point that the installed insulation will not be damaged by remaining work or exposed to weather. Wet insulation shall be removed. For thermal insulation, the actual installed thickness shall provide the R-values shown or specified.
 - 5. When unfaced insulation is used and the stud depth is larger than the insulation thickness, install wire or metal straps to hold insulation in place.
 - 6. Space insulation from heat producing devices as recommended by the manufacturer, but not closer than 3-inches.
 - 7. Electrical Wiring: Do not install insulation in a manner that would sandwich electrical wiring between two layers of insulation.
- B. Thermal Batt Roof Insulation at Metal Roofing: Install over and suspended in between metal purlins with either mechanical fasteners or suspension system to secure in place prior to and after installation of roofing.
- C. Acoustical and Thermal Batt Wall Insulation: Install as specified in Section 09250 – Gypsum Wallboard after cover material has been installed on one side of cavity.

3.02 PROTECTION

- A. Protect installed insulation and facing from harmful weather exposures and from possible physical abuses, where possible by non-delayed installation of concealing work or, where that is not possible, by temporary covering or enclosure.

END OF SECTION

AD3 Addendum No. 3 - June 2024

MANUFACTURER'S DATA



91-1210 Kaikohola Street
Ewa Beach, HI 96706
(808) 445-8226

LETTER OF TRANSMITTAL

Date	Job No.
7/29/2025	WW-4705R

DLA Relocation B393 Outdoor Storage

To: Nan, Inc.	TRANSMITTAL No: 01
Jyun-Cheng Jhuo, Project Engineer	RE: Roof Insulation

WE ARE SENDING YOU
THE FOLLOWING ITEMS

ATTACHED UNDER SEPARATE COVER VIA _____

<input type="checkbox"/> SHOP DRAWINGS	<input type="checkbox"/> PRINTS	<input type="checkbox"/> COPY OF LETTER	<input type="checkbox"/> SAMPLES	<input type="checkbox"/> SPECIFICATIONS
<input type="checkbox"/> CHANGE ORDER	<input type="checkbox"/> PLANS	<input checked="" type="checkbox"/> OTHER		

Item	Spec	Copies	DESCRIPTION
1	07210	pdf	Manufacturers Data, Insulation, ES System, Fabric, Banding, Tape, Adhesive
2	07210	pdf	Installation Instructions
3	07210	pdf	Warranty
4	07210	pdf	Safety Data Sheets

REASON FOR TRANSMITTAL, CHECKED BELOW:

<input checked="" type="checkbox"/> FOR APPROVAL	<input type="checkbox"/> APPROVED AS SUBMITTED	<input type="checkbox"/> RESUBMIT COPIES FOR APPROVAL
<input type="checkbox"/> FOR YOUR USE	<input type="checkbox"/> RETURNED FOR CORRECTIONS	<input type="checkbox"/> SUBMIT COPIES FOR DISTRIBUTION
<input type="checkbox"/> AS REQUESTED	<input type="checkbox"/> FOR REVIEW AND COMMENT	<input type="checkbox"/> RETURN CORRECTED PRINTS
<input type="checkbox"/> APPROVED AS NOTED	<input type="checkbox"/>	<input type="checkbox"/> PRINTS RETURNED AFTER LOAN TO US
<input type="checkbox"/> FOR BIDS DUE ---->	/ /	

REMARKS

Copy to:

Signed:

Hilo Wastewater Treatment Plant (WWTP)
Rehabilitation and Replacement Project, Phase 1
Waiakea, Hilo, Hawaii
County and State of Hawaii Job No. WW-4705R

Section 07210
Building Insulation

SUBMITTAL PACKAGE CONTENTS

Manufacturer Product Data – Un-Faced Insulation
Manufacturer Product Data – Silvercote ES Insulation System
Manufacturer Product Data – Silvercote ES Fabric
Manufacturer Product Data – Silvercote ES Fabric
Manufacturer Product Data – Silvercote ES Banding
Test Reports – Installation Instructions with Fall Protection
Warranty
Safety Data Sheet (SDS) - Insulation
Safety Data Sheet (SDS) – Silvercote ES Fabric
Safety Data Sheet (SDS) - Adhesives

Manufacturer Product Data – Un-Faced Insulation

Metal Building Insulation

Energy Saver FP™ Insulation System

Designed for metal buildings, the Energy Saver FP insulation and fall protection system provides an efficient state-of-the-art way to insulate and create leading edge fall protection compliant with OSHA standards when installed by certified installers. This product has been tested and complies with:

- ASTM C665, Type I
- ASTM C167
- Flame Spread <25
- ASTM E84
- ASTM C991
- Smoke Developed <50
- ASTM C553

Single Layer Roof System

- R-30 9 1/4"
- R-25 8"
- R-19 6"

Double Layer Roof Systems (New construction)

- R-43 (R-30 + R-13) 13 1/2"
- R-36 (R-25 + R-11) 11 1/2"
- R-41 (R-30 + R-11) 12 3/4"
- R-35 (R-25 + R-10) 12"
- R-40 (R-30 + R-10) 12 1/2"
- R-33 (R-25 + R-8) 10 1/2"
- R-38 (R-28 + R-10) 11 1/4"
- R-32 (R-19 + R-13) 10 1/4"
- R-38 (R-25 + R-13) 12 1/4"
- R-30 (R-19 + R-11) 9 1/2"
- R-38 (R-30 + R-8) 11 3/4"

Triple Layer Roof Systems (New construction)

- R-49 (R-19 + R-19 + R-11) 15 1/2"
- R-48 (R-19 + R-19 + R-10) 15 1/4"
- R-46 (R-19 + R-19 + R-8) 14 1/2"

Single Layer Wall System

- R-30 9 1/4"
- R-25 8"
- R-28 8"
- R-19 6"

Double Layer Wall Systems

- R-46 (R-30 + R-16) 14 1/4"
- R-43 (R-30 + R-13) 13 1/2"
- R-41 (R-28 + R-13) 12 1/4"
- R-35 (R-25 + R-10) 11 1/4"
- R-30 (R-19 + R-11) 9 1/2"

OTHER: _____

Purlin Glide FP® Insulation System

Designed for metal buildings, the Purlin Glide FP insulation and fall prevention system provides an efficient state-of-the-art way to insulate and create leading edge fall prevention compliant with OSHA standards when installed by certified installers. This product has been tested and complies with:

- ASTM C665, Type I
- ASTM C991
- Flame Spread <25
- ASTM E84
- ASTM C553
- Smoke Developed <50
- ASTM C167

Single Layer Systems

- R-30 9 1/4"
- R-20 6"
- R-13 4 1/4"
- R-10 3 1/4"
- R-25 8"
- R-19 6"
- R-11 3 1/2"
- R-8 2 1/2"

Double Layer Systems

- R-32 (R-19 + R-13) 10 1/4"
- R-26 (R-13 + R-13) 8 1/2"
- R-30 (R-19 + R-11) 9 1/4"
- R-23 (R-13 + R-10) 7 1/2"
- R-29 (R-19 + R-10) 9 1/4"
- R-20 (R-10 + R-10) 6 1/2"

Unfaced Metal Building Insulation

An unfaced fiberglass blanket designed to be used as a backfill material in a variety of insulation systems. This product has been tested and complies with:

- ASTM C665
- ASTM C991
- Flame Spread <25
- ASTM E84
- Smoke Developed <50
- R-30 9 1/4"
- R-21 6 3/4"
- R-13 4 1/4"
- R-10 3 1/4"
- R-28 8"
- R-20 6"
- R-12 3 1/2"
- R-8 2 1/2"
- R-25 8"
- R-19 6"
- R-11 3 1/2"
- R-7 2"

Faced Metal Building Insulation

A faced fiberglass blanket used in metal buildings. It is usually installed between structural steel and sheeting. This product delivers guaranteed recovered R-value prior to installation. This product has been tested and complies with:

- ASTM C665
- ASTM E84
- Flame Spread <25
- ASTM C991
- Smoke Developed <50
- R-30 9 1/4"
- R-21 6 3/4"
- R-16 5"
- R-11 3 1/2"
- R-28 8"
- R-20 6"
- R-13 4 1/4"
- R-10 3 1/4"
- R-25 8"
- R-19 6"
- R-12 3 1/2"
- R-8 2 1/2"
- 2" Condensation Blanket

Fiberglass Insulation Facts

Fiberglass insulation is made from mineral substances processed from molten state to an incombustible fibrous form.

Facing Facts

- Standard residential building insulation facings will burn and should not be left exposed.
- Residential insulation vapor retarder facings should always be installed toward the warm-in-winter side of the dwelling.
- Vapor retarders must have a rating of 1 perm or less.
- Special consideration should be given to facing choices for metal building insulation products in areas that will be exposed to excessive amounts of UV light such as buildings with open walls, large doors that will be open frequently or to buildings that will utilize indirect lighting.

Sound Facts

- Fiberglass insulation increases the Sound Transmission Class (STC) rating when properly installed in building assemblies. It has been determined that thickness has greater value in sound control than density.
- NRC (Noise Reduction Coefficient) data is available for most commonly-used products.

R-value

R-value means the resistance to heat flow. The higher the R-value the greater the insulating power.

Flame Spread, Combustion and Federal Testing

- Silvercote unfaced metal building insulation and faced metal building insulation have a class "A" rating of flame spread of 25 or less and smoke developed of 50 or less in accordance with ASTM E84 test method.
- Silvercote metal building insulation has been tested and has passed the requirements of ASTM E136 combustion characteristics and is considered non-combustible by major building codes.

Recycled Glass Content

Silvercote fiberglass insulation products manufactured in North America can contain up to an average of 61% recycled content, consisting of 20% post-consumer and 41% pre-consumer recycled glass..

Fiberglass and Mold

Fiberglass insulation will not sustain mold growth. However, mold can grow on almost any material when it becomes wet and contaminated. Carefully inspect any insulation that has been exposed to water. If it shows any sign of mold it must be discarded. If the material is wet but shows no evidence of mold, it should be dried rapidly and thoroughly. If it shows signs of facing degradation from wetting, it should be replaced.

ASTM C665 Requirements Include The Following Test Methods:

- ASTM C518 and C653 - Thermal Resistance (R-value)
- ASTM E84 - Surface Burning
- ASTM E970 - Critical Radiant Flux
- ASTM E96 - Water Vapor Permeance
- ASTM C1304 - Odor Emission SECT 13.8 - Corrosiveness
- ASTM C1338 - Fungi Resistance
- ASTM C1104 - Water Vapor Sorption

Unfaced Insulation Markings:

R-value is printed on the face of the product.

Underwriters Laboratories:

Batts/Blankets UL Listing BZJZ.R9602; BKNV.R9602 Restive Design.

Additional Certifications:

(may not apply to all products, check individual product literature for details)

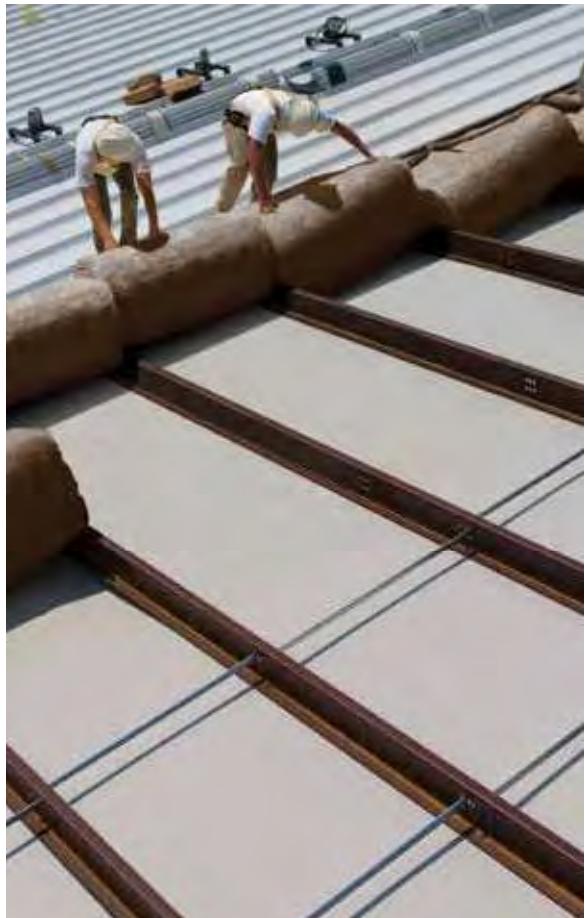
- City of New York, Department of Buildings Code Compliance for unfaced fiberglass thermal insulation code sections 27-232 and 27-348 non-combustibility. NYC MEA 417-91-M for loose-fill insulation, and MEA 416-91-M for batts.
- State of California Bureau of Electronic & Appliance Repair, Home Furnishings and Thermal Insulation certified product listing license #TA1275.
- Complies with CA Section 01350. (UL Greenguard Gold products comply)
- Compliance with City of Los Angeles, California requirements for thermal insulations.
- Minnesota Insulation Standards Program.
- National Standard of Canada CAN/ULC-S702-09 for preformed and loose-fill insulations.
- National Research Council Canada CCMC Evaluation listings for batts and loose-fill.

Please contact your Silvercote Sales Representative
for more information at (844) 232-3701 or info@silvercote.com

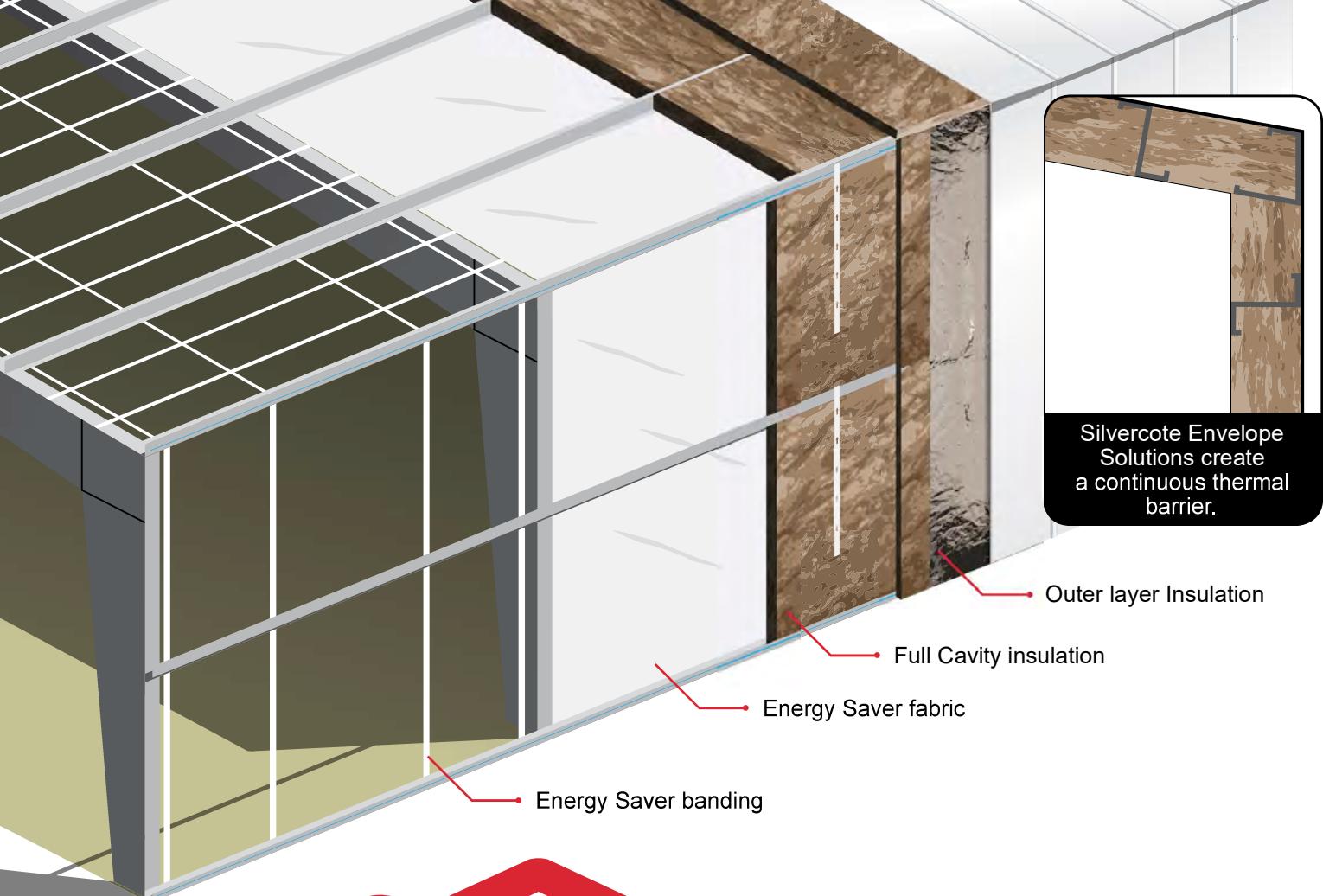
Manufacturer Product Data – Silvercote ES Insulation System



silvercote.com



FOR NEW CONSTRUCTION



Why Silvercote developed envelope solutions.

Industry wide challenges in meeting increasingly stringent building codes are the driving force behind Silvercote Envelope Solutions for Energy Saver™. Energy Saver is designed to provide optimal overall energy performance for your building.

We want to make complex building designs simple. We provide custom fabricated insulation and fabric, but also all necessary accessories and components to install your project correctly the first time.

We strive to provide customized insulation to meet for your specific project needs.

Energy Saver is the optimal Silvercote Envelope Solution!

- Our premier system can meet or exceed IECC 2015 energy code requirements
- Provides a clean and finished appearance of roofs and walls by hiding the purlins and girts
- Improves acoustical performance compared to no insulation
- When installed to Silvercote's specifications provides a barrier to air leakage and contributes to a better airtight building
- Silvercote's fabric welding technology creates a continuous single custom sized fabric

What is Energy Saver?

Energy Saver can provide our highest R-value roof and wall envelope insulation system for new construction. It consists of a network of banding straps, a bright interior support fabric and unfaced ECOSE® glass mineral wool insulation creating a total building envelope. The Energy Saver system is designed primarily for use in metal buildings, but can also be used in the roof and wall for other types of building construction.

Energy Saver FP provides OSHA-compliant leading edge fall protection. The roof system fabric is installed under the roof secondary structure and is supported by a banding grid system. ECOSE glass mineral wool insulation is installed in varying thickness between and across the purlins to obtain the desired insulating values.

The Energy Saver wall system is offered in a single or double layer ECOSE glass mineral wool insulation system. Fabric is installed in the interior resulting in a bright finished wall appearance.

Improve productivity

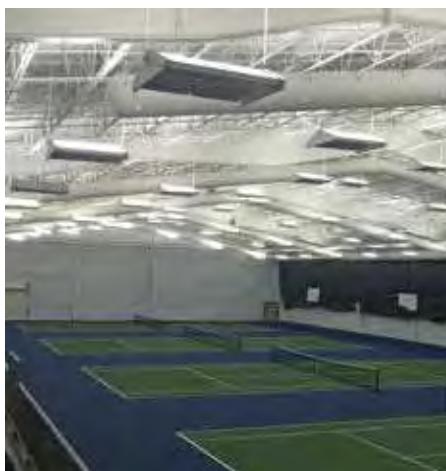
71 percent of office workers list noise as a key impediment to productivity. In fact, noise pollution is a major environmental problem and exposure to excessive noise causes stress, poor concentration, productivity reduction, fatigue and loss of psychological well-being. ECOSE glass mineral wool insulation in walls, ceilings, floors and ducts significantly reduces the amount of noise inside buildings.

Insulation products, specifically wall and ceiling insulations also reduce noise transfer from one room to another.



Use Energy Saver Envelope in:

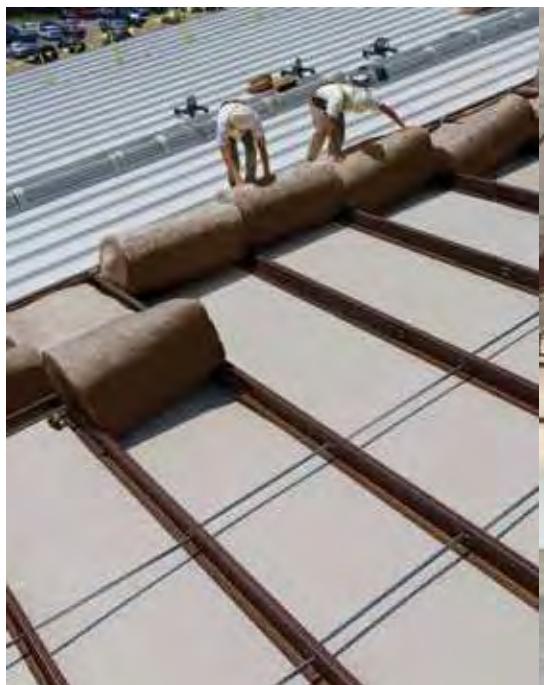
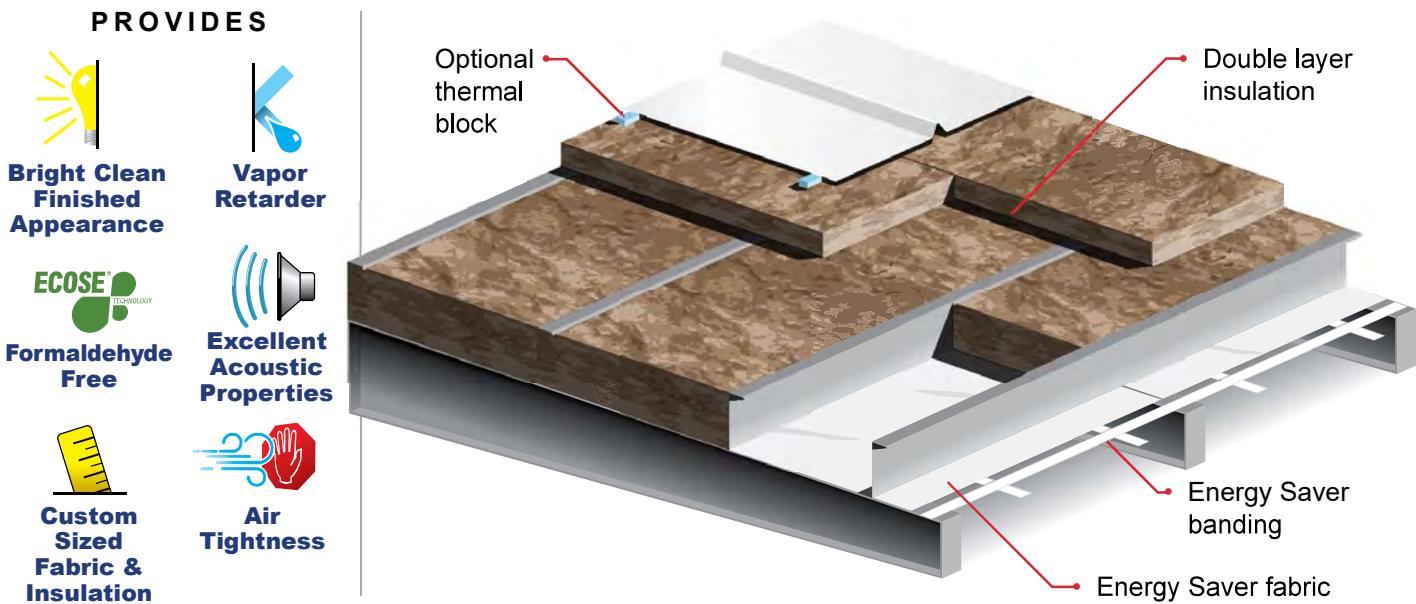
- Manufacturing facilities
- Aircraft hangers
- Sports arenas
- Retail locations



Energy Saver Roof

Energy Saver FP™ (OSHA-compliant leading edge fall protection) roof system fabric is installed under the roof secondary structure and is supported by a banding grid system. Unfaced glass mineral wool insulation is installed between and above the purlins in varying thickness combinations to obtain the desired insulating values.

- Provides a continuous vapor retarder
- Our Energy Saver fabric welding process produces seams that exceed the ASTMD-751 Standard of the fabric itself
- Free online, Energy Saver Roof Fall Protection system training available



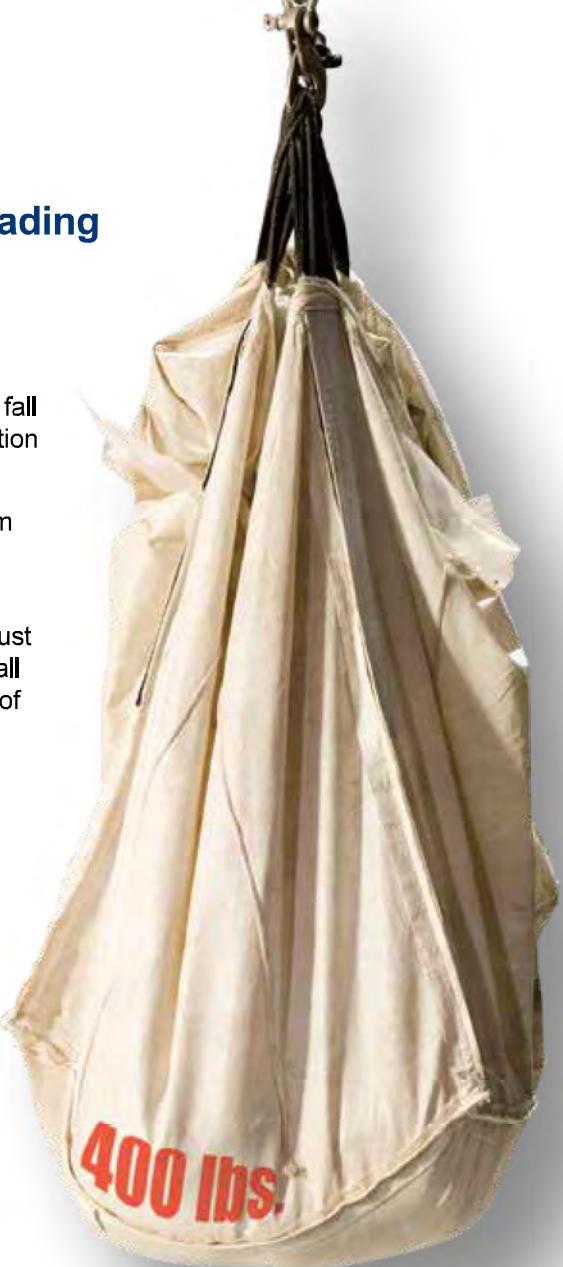


OSHA-compliant leading edge fall protection for roofs

Energy Saver FP protects the installation crew while the building is being insulated and roofed by providing OSHA-compliant leading edge fall protection when installed by a Silvercote certified contractor. Our certification is free and can be completed at silvercote.com

To meet OSHA guidelines, an insulation support and fall protection system must restrain and support 400 pounds dropped from at least 42" above the highest walking or working surface.

Energy Saver FP provides fall protection at the leading edge only and is just one component of a total fall protection plan for the job. Other means of fall protection are still required within six feet (6') of any exterior roof edge, roof opening or common rafter where the system has not been completely installed in both bays.



Tensile strength testing –

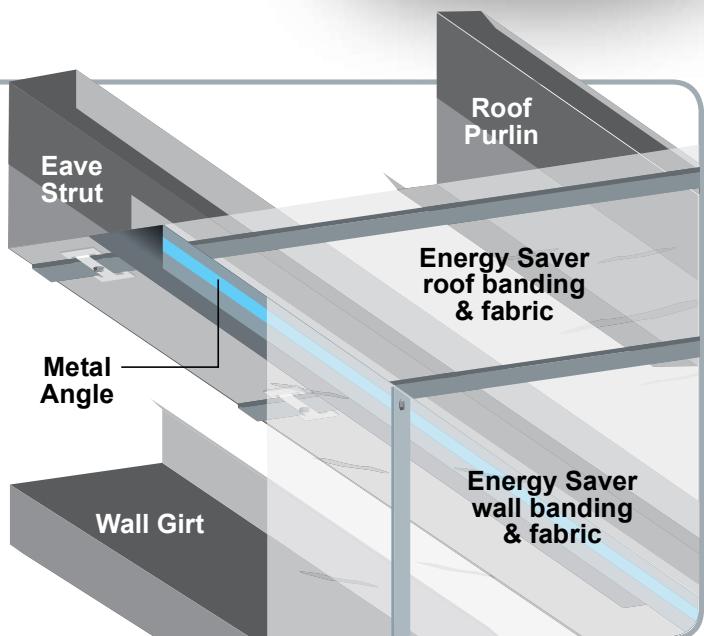
We conduct daily testing on actual production samples of welded Energy Saver FP fabric to ensure your safety. Production samples must exhibit a seam strength of more than double the required failure strength to meet our standards and be considered acceptable for use in our roof Energy Saver FP system.



IT'S IN THE DETAILS

There are many different connection needs based on manufacturer specifications for your building. A secure connection must be made around the entire perimeter and each penetration of the Energy Saver fabric to create a sealed envelope.

Silvercote provides specifications for many standard connections. **See the Energy Saver Install Instructions at Silvercote.com for specific details.**



COMcheck™ Solutions

Your Silvercote sales representative can provide help to meet your energy code compliance.

"The COMcheck product group makes it easy for architects, builders, designers, and contractors to determine whether new commercial or high-rise residential buildings, additions, and alterations meet the requirements of the IECC and ASHRAE Standard 90.1, as well as several state-specific codes. COMcheck also simplifies compliance for building officials, plan checkers, and inspectors by allowing them to quickly determine if a building project meets the code."

U.S. Department of Energy

Hot Box Testing

ASTM C1363-11 – Standard Test Method for Thermal Performance of Building Materials and Envelope Assemblies by means of a Hot Box Apparatus.

To accomplish this test, a box is outfitted with sensors that accurately measure the rate at which heat flows through a building assembly (roof or wall). The corresponding data is presented in the form of a "U-factor."

U-factors

DOUBLE LAYER ROOF*	
R-25 + R-8.....	0.035
8" Z purlin	
1" EPS spacer block	
standing seam roof	
 R-30 + R-8.....	0.0299
10" Z purlin	
1" EPS spacer block	
standing seam roof	

* NAHB research center in Richmond, VA.

** ASHRAE. ^ Minimum R-3 thermal spacer block is required.

SINGLE LAYER WALL**

Rated insulation	U-factor for base wall assembly
R-25	0.059
R-30	0.052

DOUBLE LAYER WALL**

Rated insulation	U-factor for base wall assembly
R-25 + R-10.....	0.047
R-25 + R-16.....	0.042
R-25 + R-10^.....	0.039
R-30 + R-16.....	0.039

LEED Eligible Glass Mineral Wool Insulation

- Optimized energy performance
- Reduced demand for virgin materials
- 80% recycled content
- Use of regional materials
- Incorporating rapidly renewable materials
- Improved air quality
- A comfortable thermal environment
- High performance acoustic properties



Save more than energy

Did you know that insulation saves commercial building owners more than \$9.6 billion in energy costs annually?

Insulation also reduces annual energy use in U.S. buildings by 12 quadrillion BTUs, roughly 15 percent of total U.S. annual energy usage. It also diminishes power plant emissions, cutting carbon dioxide by 780 million tons annually. (The figures include both commercial and residential buildings and are taken from the study "Green and Competitive: The Energy, Environmental and Economic Benefits of Fiber Glass and Mineral Wool Insulation Products.")

According to the U.S. Department of Energy, one third of the energy used in commercial buildings is devoted to heating and cooling.

That's why it makes good business sense to maximize the glass mineral wool insulation in your building(s) to achieve greater energy savings and reduce heating and cooling loads.

Of course this is just the tip of the iceberg. There are layers of benefits to adding glass mineral wool insulation in commercial buildings - from increased energy savings, temperature and condensation control to noise reduction and environmental sustainability.



Architects

We know how important aesthetics, acoustical properties and thermal performance are for your clients. Energy Saver systems provide a clean, bright finished ceiling for maximum lighting efficiency and meets or exceeds the IECC 2015 energy codes with unlimited R-value capability.

Metal Building Manufacturers and Owners

You can have confidence in Energy Saver's longevity and durability. Energy Saver systems are engineered to last – just like your metal buildings. Energy Saver's full cavity envelope creates a continuous thermal shield to make sure you get the maximum return on your investment.

Contractors and Installers

We know how important safety is on the jobsite. Energy Saver FP meets OSHA-compliant leading edge fall protection standards. We make it easy for you and your crew to install by using our simplified instructions. Free online, Energy Saver Fall Protection system training available.

Energy Saver Envelope Components and Accessories

Insulation – Our metal building insulation is available with formaldehyde free ECOSE Technology binder, which is GREENGUARD Gold certified. Our glass mineral wool insulation features an FHC 25/50 flame spread and smoke developed rating per ASTM E84 Standards. This superior glass mineral wool insulation can be cut to width for your building specifications.

Fabric – Energy Saver fabric is a woven reinforced high-density polyethylene yarn, then coated on both sides with a continuous white or colored polyethylene coating. Our fabric provides a bright and durable interior finish. It is folded to allow for rapid pullout onto the banding grid and features an FHC 25/50 rating per ASTM E84 Standards.



Color	White/grey
Weight	4.4 oz/yd ² (149g/m ²) +/- 5 %
Thickness	Nominal 9 mil (0.22 mm) ASTM D1777
Grab Tensile	Warp 130 lb 577 N / Weft 155 lb 510 N, ASTM D-5034
Strip Tensile (N/5cm)	Warp 95 lb/in (843)/Weft 90 lb/in (799), ASTM D-5035
Tongue Tear	Warp 50 lb 222 N / Weft 45 lb 200 N, ASTM D-2261
Mullen Burst	235 psi 1619 kPa, ASTM D-3786
Moisture Vapor Transmission	0.02 perms, ASTM E-96
Surface Burning Characteristics	Flame Spread: 0, Smoke Developed: 30 (white side exposed) UL723 (ASTM E84)
UV Weathering	UV stabilizer added for Extra UV resistance

Note: These are manufacturer supplied property values and are intended as guides only. The figures listed do not represent specification minimums or limits.

Energy Saver Adhesive – Our specially designed high shear and high tack adhesive bonds the fabric to the steel framing.

Energy Saver Patch Tape – Designed to mimic the appearance of the Energy Saver fabric our patch tape is used to seal cuts around protrusions.

Energy Saver Foam tape – Applied to the outer secondary steel to help reduce heat transfer.

Energy Saver Banding – The banding provides abundant support for the Energy Saver components while contributing properly designed strength characteristics necessary to pass the rigorous 400 pound drop test (as per OSHA 1926.502) for Energy Saver FP.

Energy Saver Banding Clips – United States Patent 8,015,769.

The banding clips provide a clean, finished appearance, while minimizing the number of fasteners required.

Insul-Hold – Used to support our glass mineral wool insulation in the wall girt cavity. Unlike other products, they can be cut to length to fit the metal frame.

OSHA-compliant leading edge fall protection – The Energy Saver FP system provides OSHA-compliant leading edge fall protection when installed according to manufacturer's instructions by a Silvercote certified installing contractor. Energy Saver FP is fall protection at the leading edge only and is only one component of a total fall protection plan for the job. Other means of fall protection are still required within six feet (6') of any exterior roof edge, roof opening or common rafter where the system has not been completely installed in both bays. Contact your Silvercote sales representative or see the Energy Saver FP Contractor Agreement and installation instructions for more details. Certification is available online at silvercote.com.

Note: As per Energy Saver certification OSHA-compliant leading edge fall protection with this system, install only Energy Saver components and accessories that are sent with your order.

Manufacturer Product Data – Silvercote ES Fabric



silvercote.com

TECHNICAL DATA SHEET

ENERGY SAVER™ FABRIC

DESCRIPTION

Type 1070 Vapor Retarder is a premium, low-permeance vapor retarder for thermal insulation.

FABRIC SPECIFICATIONS

Weave	Woven HPDE scrim
Coating	2.0 mil/1.25 mil average (47/29 g/m ² /side)
Color	White/gray
Weight.....	4.4 oz/yd ² (149g/m ²) +/- 5 %
Thickness	Nominal 9 mil (0.22 mm) ASTM D1777

PERFORMANCE PROPERTIES

The following data are typical values based on ASTM and other standard tests. These data should not be considered specification.

CLASSIFICATION

TYPE V AND TYPE VI

Grab Tensile	Warp 130 lb 577 N / Weft 155 lb 510 N
ASTM D-5034	
Strip Tensile (N/5cm)	Warp 95 lb/in (843)/Weft 90 lb/in (799)
ASTM D-5035	
Tongue Tear	Warp 50 lb 222 N / Weft 45 lb 200 N
ASTM D-2261	
Mullen Burst.....	235 psi 1619 kPa
ASTM D-3786	
Light Reflectance Value	81
ASTM E-1477	
Moisture Vapor Transmission	0.02 perms
ASTM E-96	
Dimensional Stability	Warp -1.0% / Weft -2.0%
ASTM D1204	
Thermal Stability.....	-20°F No cracks or delamination 150°F No cracks or delamination
ASTM C1263	
Surface Burning Characteristics.....	Flame Spread: 0 Smoke Developed: 30 (white side exposed)
UL723 (ASTM E84)	
Elevated Temperature and Humidity Resistance .	0.02 perms No delamination
ASTM C1258	
Fungi Resistance	No growth (ATCC #'s 9642, 6205, 11797, 11730 and 9643)
ASTM C-1338	
UV Weathering	UV stabilizer added for Extra UV resistance

Please contact your Silvercote Sales Representative
for more information at (844) 232-3701 or info@silvercote.com

Manufacturer Product Data – Silvercote ES Fabric



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element.com

**EVALUATION OF THE AIR PERMEANCE PROPERTIES OF
“TYPE 1070”
WOVEN COATED POLYETHYLENE MATERIAL IN ACCORDANCE WITH ASTM E2178**

Report to: Intertape Polymer Group (IPG)
50 Abbey Avenue
Truro, NS
B2N 6W4

Attention: Sherryl Patton

Telephone: +1 (902) 896-1088
Cell: +1 (902) 890-5353

Email: SPatton@itape.com

Original Report No.: 20-06-B0090
5 Pages, 2 Appendices

Proposal No.: 20-006-175915

Original Date: June 30, 2020

1.0 INTRODUCTION

At the request of Intertape Polymer Group (IPG), Element Toronto was retained to evaluate the air permeance properties of "Type 1070", a woven coated polyethylene material in accordance with ASTM E2178 as outlined in Element Proposal Number: 20-006-175915.

The material used for testing was prepared by IPG and shipped to Element Toronto for testing. No special sampling procedures were used by Element Toronto to select the specimens.

Upon receipt, the specimens were assigned the following Element Specimen Numbers:

Client Sample Description:
Type 1070 – woven coated polyethylene

Element Specimen No.:
20-06-B0090-AP1 to AP5

2.0 PROCEDURE

The sample was evaluated for the following test:

Test Description	Test Method
Standard Test Method for Air Permeance of Building Materials	ASTM E2178-13

Note: SI units are the primary units of measure.

Air Permeance Specimen Preparation:

Material, five (5) 1.1 m x 1.1 m (43.34" x 43.34") test samples were cut from an 8' wide roll. The specimens were conditioned for a minimum of 72 hours at $23 \pm 2^\circ\text{C}$ and $50 \pm 5\%$ RH.

Each specimen was installed within the air sealed test chamber as prescribed by ASTM E2178-13 standard (*Figure 1*).

The initial air leakage rate was measured by exhausting the air within the test chamber at a rate required to maintain the following incremental test pressure differentials of 25, 50, 75, 100, 150, and 300 Pa (0.52, 1.04, 1.57, 2.09, 3.13, and 6.27 psf), followed by decremental pressure differentials of 100, 75 and 50 Pa (2.09, 1.57, and 1.04 psf). Simultaneously, the test specimen was monitored for any physical changes.

2.0 PROCEDURE (CONTINUED)

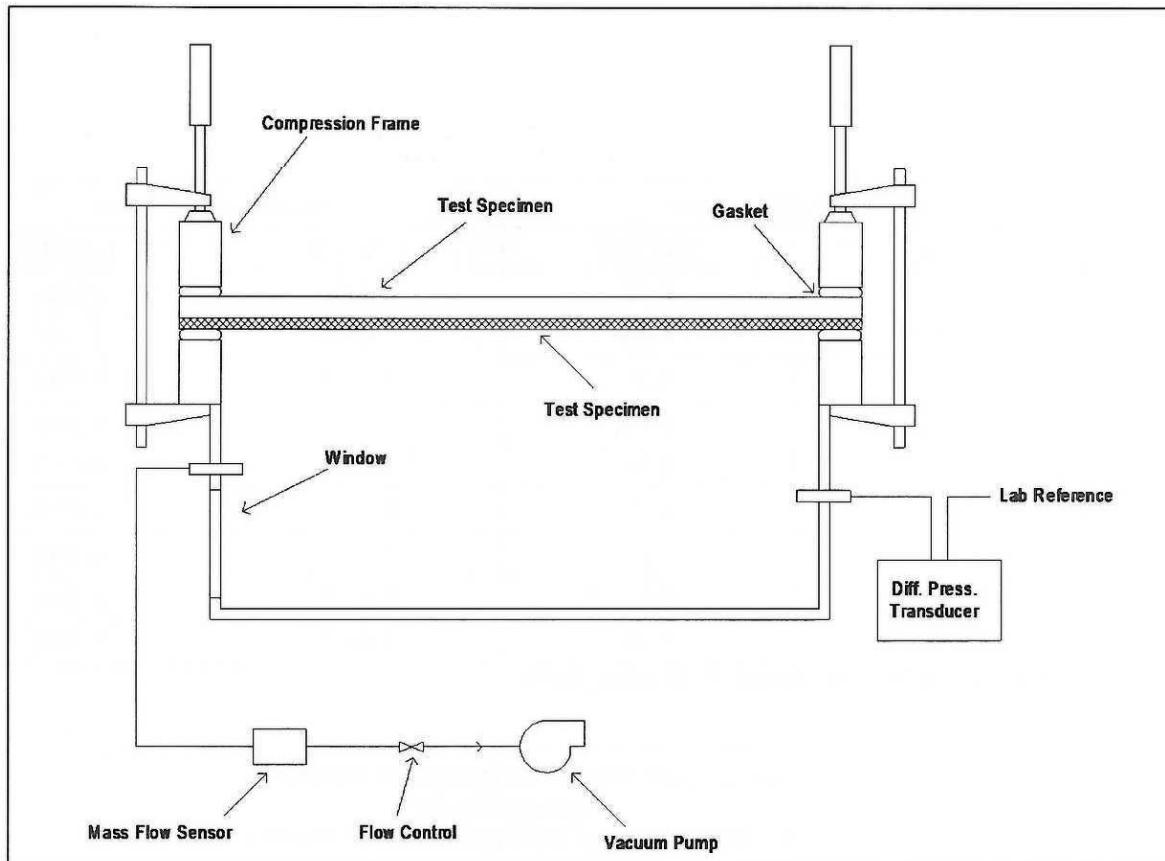


Figure 1 – Test Setup (ASTM E2178-13)

Equipment Used for Air Flow Measurements:

Manometer: MII B06794
Mass Flow Meter: MII A09200
Multimeter: MII B05011
Condition Room: MII B09680
Calipers: MII B13680
ASTM E2178-13 Chamber: 07973 (for reference)

Testing for each specimen was conducted on the following dates:

<u>Element Specimen No.:</u>	<u>Date:</u>
20-096-B0090-AP1	June 22, 2020
20-096-B0090-AP2	June 22, 2020
20-096-B0090-AP3	June 23, 2020
20-096-B0090-AP4	June 23, 2020
20-096-B0090-AP5	June 23, 2020

3.0 RESULTS

The air permeance average results of the individual specimens are outlined in Table 1. Detailed individual test specimen details can be found in Appendix A and B. SI units are the primary unit of measure.

Table 1 – Air Permeance Averages in Accordance with ASTM E2178-13
Element Sample Number: 20-06-B0090-AP1 to AP5

Differential Pressure		Calculated Air Flow	
Pa	(lbs./ft. ²)	(L/s·m ²)	(cfm/ft. ²)
25	0.52	0.0008	0.0002
50	1.05	0.0015	0.0003
75	1.57	0.0020	0.0004
100	2.09	0.0025	0.0005
150	3.14	0.0035	0.0007
300	6.27	0.0061	0.0012
100	2.09	0.0025	0.0005
75	1.57	0.0020	0.0004
50	1.05	0.0014	0.0003

Average Specimen Thickness: 0.18 mm (0.007")

Calculated Flow vs. Differential Pressure
ASTM E2178-13
Element Specimen No.: 20-06-B0090-AP1 to AP5

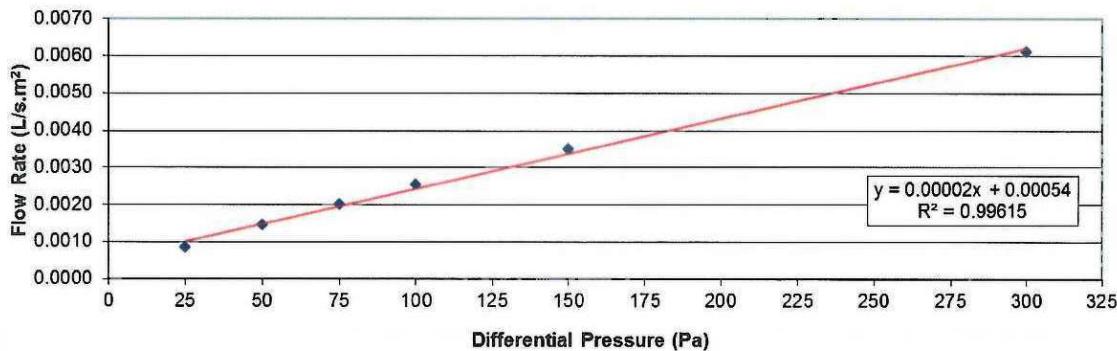


Figure 2 - Average Calculated Flow vs. Differential Pressure

4.0 CONCLUSION

Element Sample Numbers. 20-06-B0090-AP1 to AP5 identified as "Type 1070 – woven coated polyethylene" achieved the air permeance requirements with an average air leakage result of 0.0020 L/(s·m²) (0.0005 cfm/ft²) at 75 Pa (1.57 PSF) at an average thickness of 0.18 mm (0.007"). This is below the maximum allowable air leakage resistance requirement of 0.02 L/(s·m²) (0.0039 cfm/ft²)

5.0 REPORT REVISION SUMMARY

Revision No:
Original

Date:
June 30, 2020

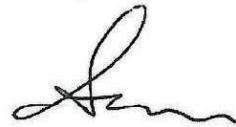
Description of Revisions:
Original Document

Reported by:

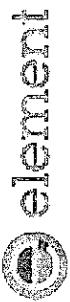


Fadi G. Basmaji, M.A.Sc., B.Eng., Ext. 11227
Building Products Specialist
Building Science Division

Reviewed by:



Allan Lawrence, Ext. 11212
Supervisor, Building Science
Building Science Division



APPENDIX A

Individual Specimen Data.

(3 Pages)

Table A1 – Air Permeance Results in Accordance with ASTM E2178-13
Element Sample Number: 20-06-B0090-AP1

Differential Pressure		Calculated Air Flow	
Pa	(lbs./ft. ²)	(L/s·m ²)	(cfm/ft. ²)
25	0.52	0.0006	0.0001
50	1.05	0.0011	0.0002
75	1.57	0.0016	0.0003
100	2.09	0.0020	0.0004
150	3.14	0.0029	0.0006
300	6.27	0.0051	0.0010
100	2.09	0.0021	0.0004
75	1.57	0.0017	0.0003
50	1.05	0.0013	0.0003

Average Specimen Thickness: 0.17 mm (0.007")

Table A2 – Air Permeance Results in Accordance with ASTM E2178-13
Element Sample Number: 20-06-B0090-AP2

Differential Pressure		Calculated Air Flow	
Pa	(lbs./ft. ²)	(L/s·m ²)	(cfm/ft. ²)
25	0.52	0.0010	0.0002
50	1.05	0.0015	0.0003
75	1.57	0.0020	0.0004
100	2.09	0.0024	0.0005
150	3.14	0.0032	0.0006
300	6.27	0.0050	0.0010
100	2.09	0.0024	0.0005
75	1.57	0.0020	0.0004
50	1.05	0.0014	0.0003

Average Specimen Thickness: 0.18 mm (0.007")



Table A3 – Air Permeance Results in Accordance with ASTM E2178-13
Element Sample Number: 20-06-B0090-AP3

Differential Pressure		Calculated Air Flow	
Pa	(lbs./ft. ²)	(L/s·m ²)	(cfm/ft. ²)
25	0.52	0.0012	0.0002
50	1.05	0.0020	0.0004
75	1.57	0.0028	0.0006
100	2.09	0.0035	0.0007
150	3.14	0.0048	0.0010
300	6.27	0.0083	0.0017
100	2.09	0.0031	0.0006
75	1.57	0.0025	0.0005
50	1.05	0.0018	0.0004

Average Specimen Thickness: 0.18 mm (0.007")

Table A4 – Air Permeance Results in Accordance with ASTM E2178-13
Element Sample Number: 20-06-B0090-AP4

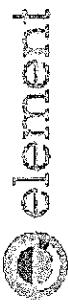
Differential Pressure		Calculated Air Flow	
Pa	(lbs./ft. ²)	(L/s·m ²)	(cfm/ft. ²)
25	0.52	0.0005	0.0001
50	1.05	0.0009	0.0002
75	1.57	0.0013	0.0003
100	2.09	0.0017	0.0003
150	3.14	0.0025	0.0005
300	6.27	0.0049	0.0010
100	2.09	0.0018	0.0004
75	1.57	0.0014	0.0003
50	1.05	0.0009	0.0002

Average Specimen Thickness: 0.17 mm (0.007")

Table A5 – Air Permeance Results in Accordance with ASTM E2178-13
Element Sample Number: 20-06-B0090-AP5

Differential Pressure		Calculated Air Flow	
Pa	(lbs./ft. ²)	(L/s·m ²)	(cfm/ft. ²)
25	0.52	0.0010	0.0002
50	1.05	0.0017	0.0003
75	1.57	0.0023	0.0005
100	2.09	0.0030	0.0006
150	3.14	0.0041	0.0008
300	6.27	0.0072	0.0015
100	2.09	0.0030	0.0006
75	1.57	0.0024	0.0005
50	1.05	0.0016	0.0003

Average Specimen Thickness: 0.18 mm (0.007")



APPENDIX B

Air Flow Versus Pressure Differential (log/log) Graphs

(5 Pages)

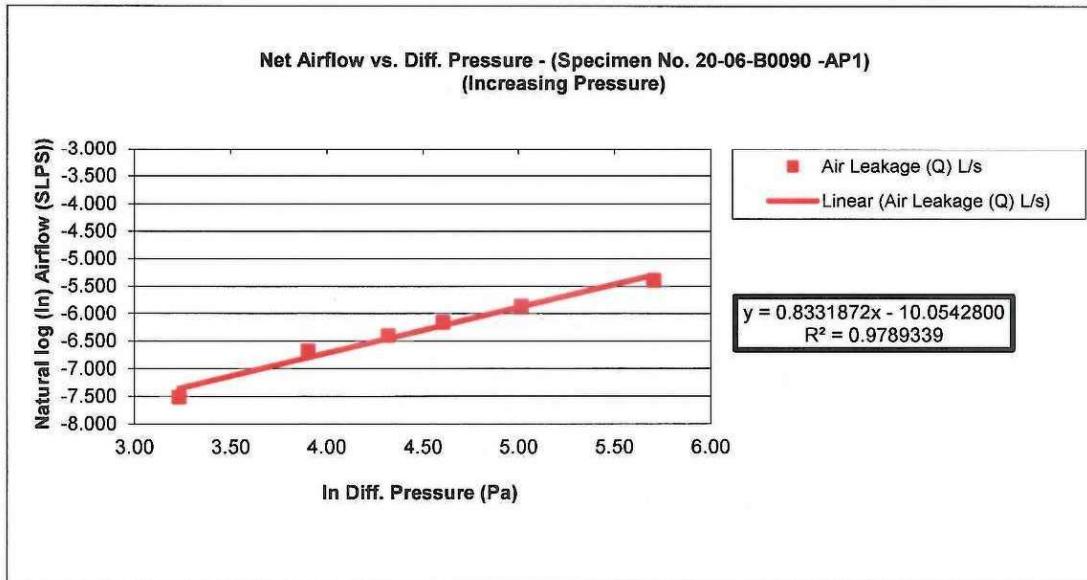


Figure B-1 – Element Specimen No.: 20-06-B0090-AP1 Increasing Air Flow vs. Pressure
Direction of Air Flow: Infiltration

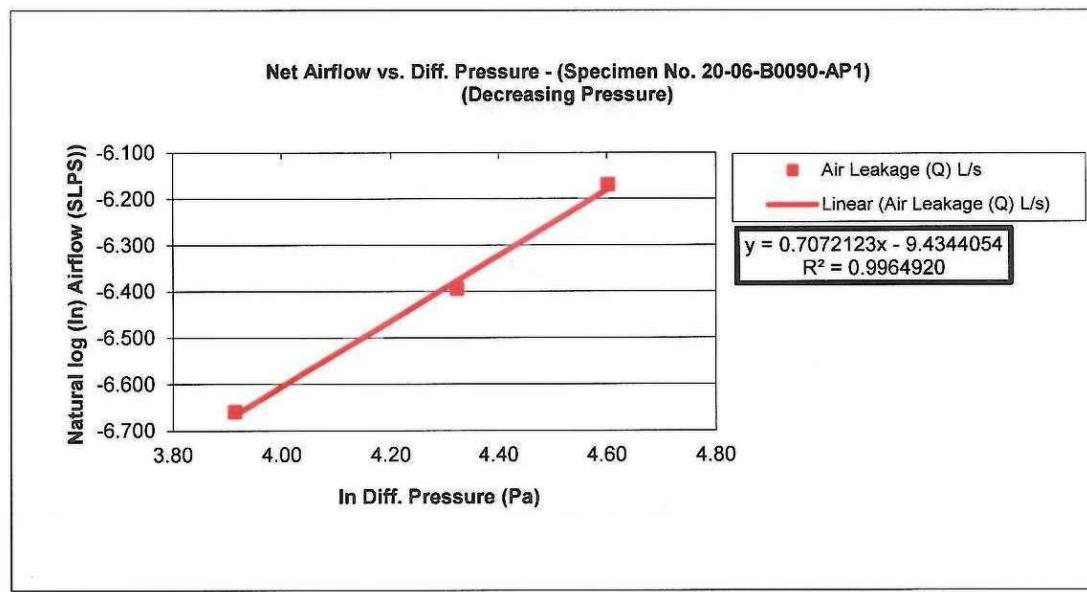


Figure B-2 – Element Specimen No.: 20-06-B0090-AP1 Decreasing Air Flow vs. Pressure
Direction of Air Flow: Infiltration.

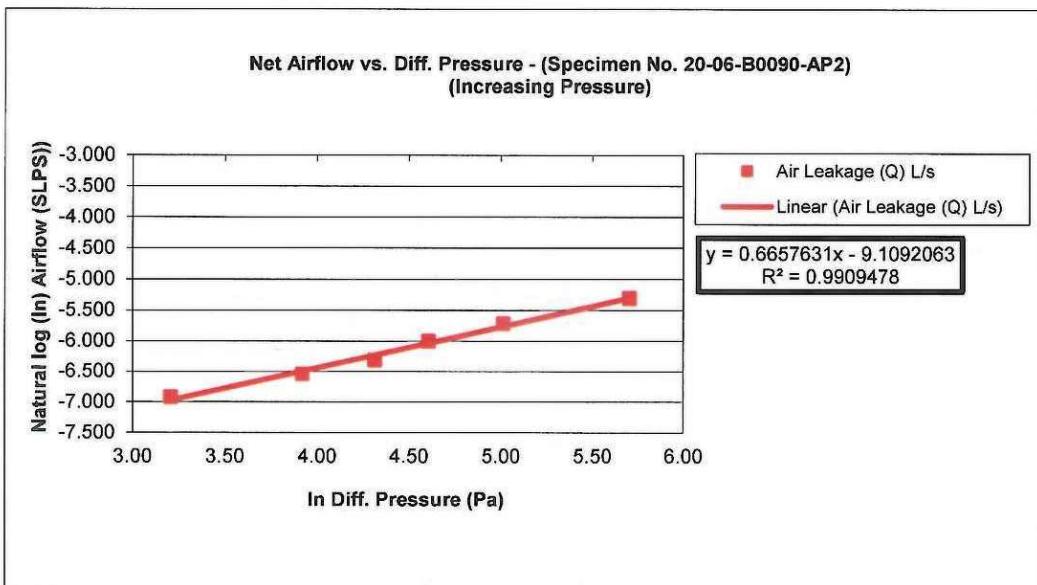


Figure B-3 – Element Specimen No.: 20-06-B0090-AP2 Increasing Air Flow vs. Pressure
Direction of Air Flow: Infiltration

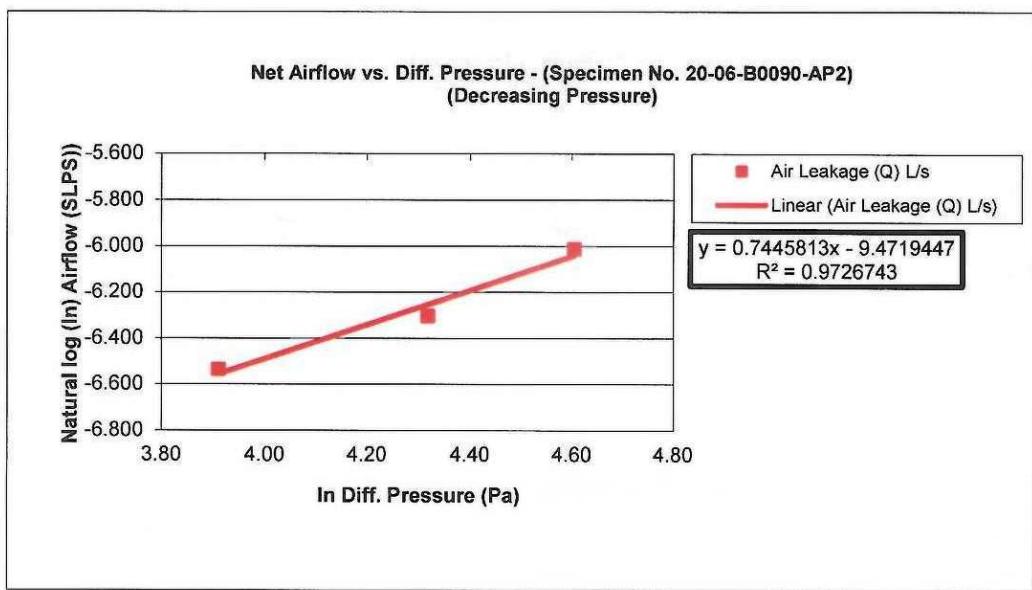


Figure B-4 – Element Specimen No.: 20-06-B0090-AP2 Decreasing Air Flow vs. Pressure
Direction of Air Flow: Infiltration.

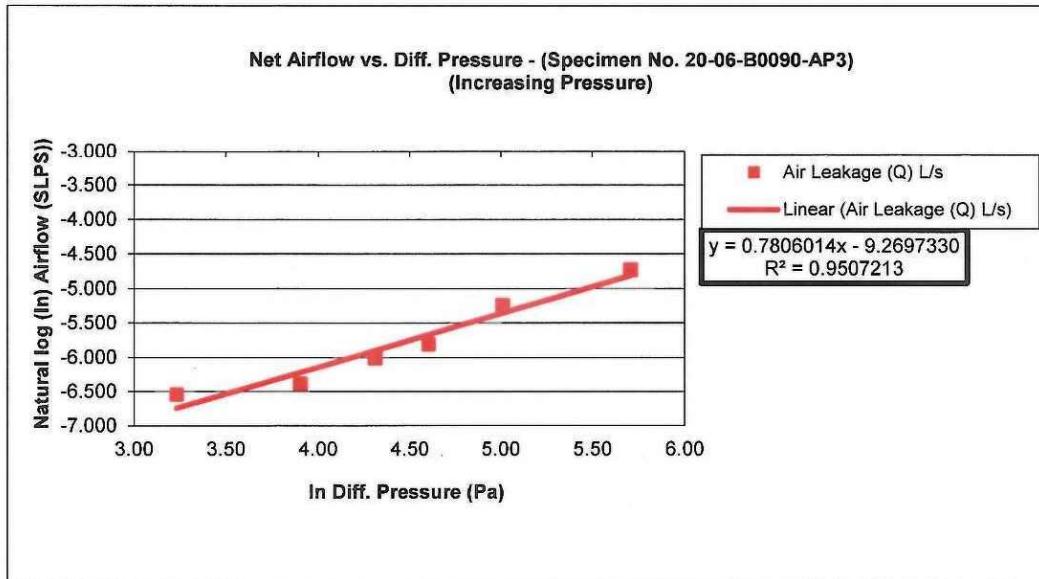


Figure B-5 – Element Specimen No.: 20-06-B0090-AP3 Increasing Air Flow vs. Pressure
Direction of Air Flow: Infiltration

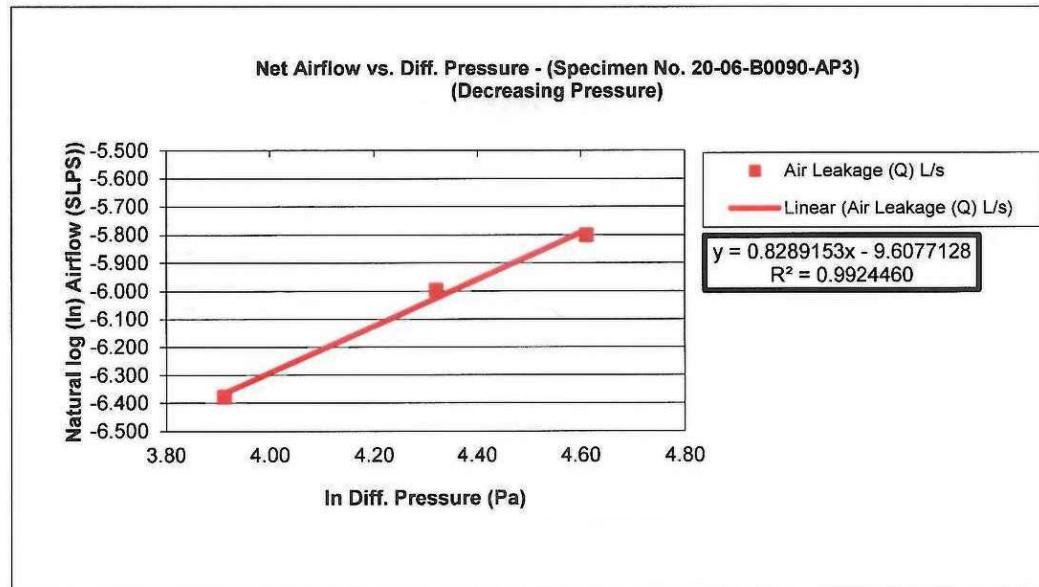


Figure B-6 – Element Specimen No.: 20-06-B00909-AP3 Decreasing Air Flow vs. Pressure
Direction of Air Flow: Infiltration.

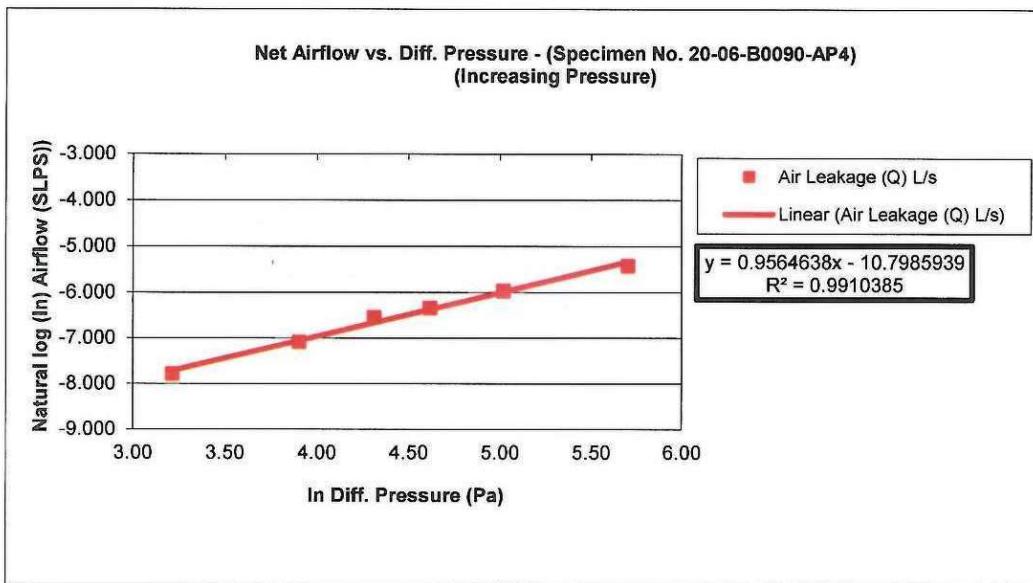


Figure B-7 – Element Specimen No.: 20-06-B0090-AP4 Increasing Air Flow vs. Pressure
Direction of Air Flow: Infiltration

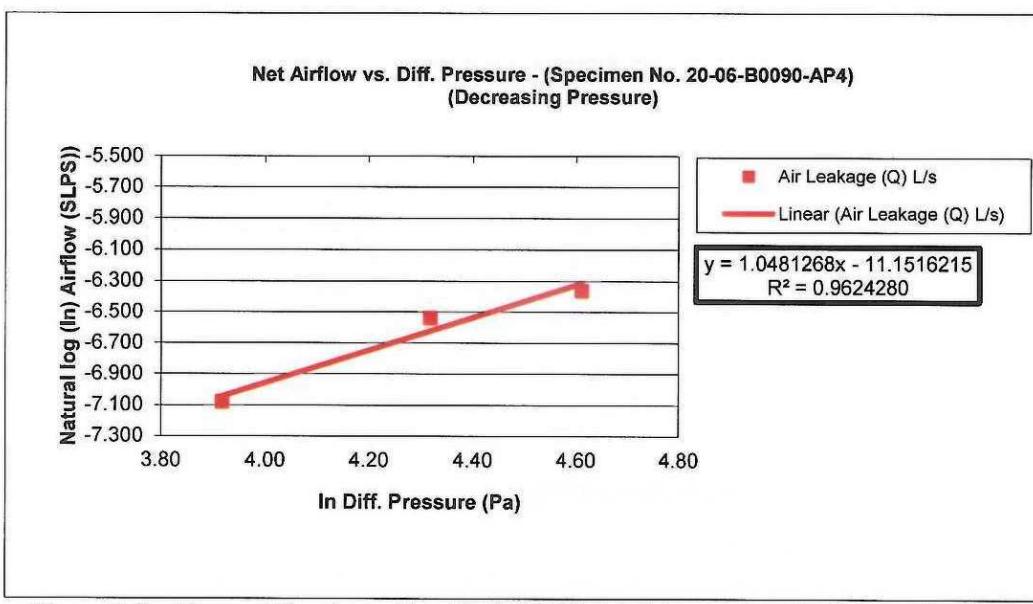


Figure B-8 – Element Specimen No.: 20-06-B0090-AP4 Decreasing Air Flow vs. Pressure
Direction of Air Flow: Infiltration.

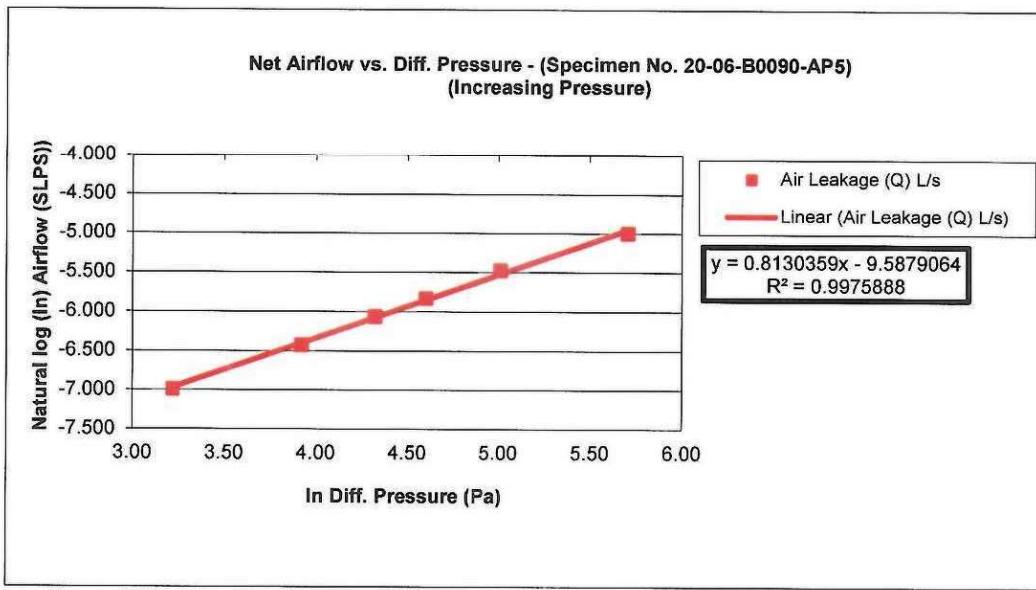


Figure B-9 – Element Specimen No.: 20-06-B0090-AP5 Increasing Air Flow vs. Pressure
Direction of Air Flow: Infiltration

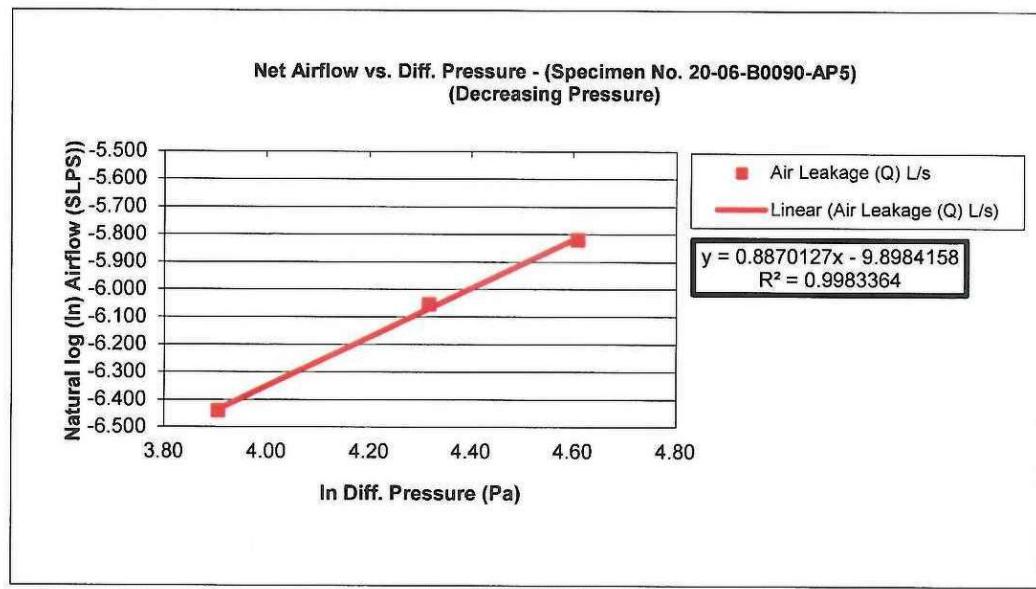


Figure B-10 – Element Specimen No.: 20-06-B0090-AP5 Decreasing Air Flow vs. Pressure
Direction of Air Flow: Infiltration.

Manufacturer Product Data – Silvercote ES Banding

TECHNICAL DATA SHEET

ENERGY SAVER™ BANDING

DESCRIPTION

Metal strapping used to support the Energy Saver liner system for both roofs and walls.

SPECIFICATIONS

Size:	0.022 + 0.003/-0 x 1.000 +/- 0.005 x 150 coil
Banding:	Hot Dipped Galvanized, Structural Steel Grade 60, Zinc coated ASTM A653
Colors:	White/Grey, Black/Black

MECHANICAL REQUIREMENTS

Tensile:	70 ksi min
Yield:	60 ksi min
Elongation in 2 :	10% min

PLEASE CONTACT YOUR SILVERCOTE SALES REPRESENTATIVE
FOR MORE INFORMATION AT (844) 232-3701 OR INFO@SILVERCOTE.COM

Manufacturer Product Data – Silvercote ES Patch Tape

TECHNICAL DATA SHEET

ENERGY SAVER™ PATCH TAPE

DESCRIPTION

Used primarily for repairing small tears in Energy Saver fabric.

FABRIC SPECIFICATIONS

Thickness: 10.5 Mils

Standard Width: 3"

Standard Lengths: 150'

Colors: White, Black

PERFORMANCE PROPERTIES

Adhesion

Peel: 70 oz./in. @ 72°

Tensile: Warp 95 lb/in (843)/Weft 90 lb/in (799)

**PLEASE CONTACT YOUR SILVERCOTE SALES REPRESENTATIVE
FOR MORE INFORMATION AT (844) 232-3701 OR INFO@SILVERCOTE.COM**

1. Manufacturer Product Data – Silvercote ES Adhesive

TECHNICAL DATA SHEET

ENERGY SAVER™ ADHESIVE

DESCRIPTION

Used for securing Energy Saver vapor retarder fabric to building structural to maintain a continuous vapor retarder.

FEATURES

- High shear
- Moderate heat resistance
- Good performance on a wide variety of substrates
- Good humidity performance

TYPICAL PHYSICAL PROPERTIES¹

Solids	58%
Viscosity	5000 cP
Solvent, wt%	Toluene 80 Heptane 20
Density	7.8 lb/gal

TYPICAL PERFORMANCE¹

Transfer coatings on 2 mil polyester

Coating thickness Test panel	1 mil SS	1 mil HDPE	2 mil SS	2 mi HDPE
180° Peel (ozf/in)				
20 minutes	110	92	154	113
24 hours	120	104	149	134
1 week @ RT	124	N/A	150	N/A
1 week @ 158° F	124	N/A	155	N/A
1 week @ 95° F/95%RH	115	N/A	136	N/A
Shear (h)				
4.4 psi @ 72° F	Indefinite	N/A	N/A	N/A
8.8 psi @ 72° F	>168 hrs	N/A	>168	N/A
Tack (ozf/in)				
PET: 1" x 1" x 500 grams	150	N/A	172	N/A
1" x 1" x 1000 grams	193	N/A	180	N/A
Foil: 1" x 1" x 500 grams	170	N/A	171	N/A
	170	N/A	176	N/A

1. Not to be used for setting specifications

DESCRIPTION

A high shear, high tack solution rubber pressure sensitive adhesive designed for securing Energy Saver vapor retarder fabric to building structural to maintain a continuous vapor retarder.

APPLICATION GUIDE

Apply by any conventional method including reverse roll and knife-over-roll. Product is designed to be ready for use. If dilution is required, however, hydrocarbon solvents such as toluene or heptane are suggested. It is strongly advised that evaluations of the adhesive be carried out to determine whether the product is suitable for use under individual coater operating conditions. Typical adhesive deposition is 1 to 2 mils dry for most applications. Drying in a zoned oven is recommended with the last zone as hot as possible to maximize cure rate. Cure is dependent upon drying conditions (heat, dwell time).

FDA COMPLIANCE

The dry film components comply with the compositional requirements of the FDA Indirect Food Additive Regulation 21 CFR 175.105 "Adhesives."

STORAGE, HANDLING AND PRECAUTIONS

Under normal conditions, product is stable for a minimum of 12 months in unopened containers. Store drums in dry areas and keep them tightly covered to prevent solvent loss and contamination. Rotate stock using the oldest material first. Mix the adhesive thoroughly before use and do not mix it with any other products. Consult the Material Safety Data Sheet (MSDS) for hazardous ingredients, flammability, disposal, and related handling information.

Product contains flammable solvents; eliminate all sources of ignition before use. Use with adequate ventilation, avoid breathing of vapor; minimize skin contact. Migratory materials in some face stocks and end-use substrates, e.g., vinyl films and foams, may affect performance. It is recommended that products be thoroughly tested for a particular application before large-scale use is attempted.

STATEMENT OF PRACTICAL USE

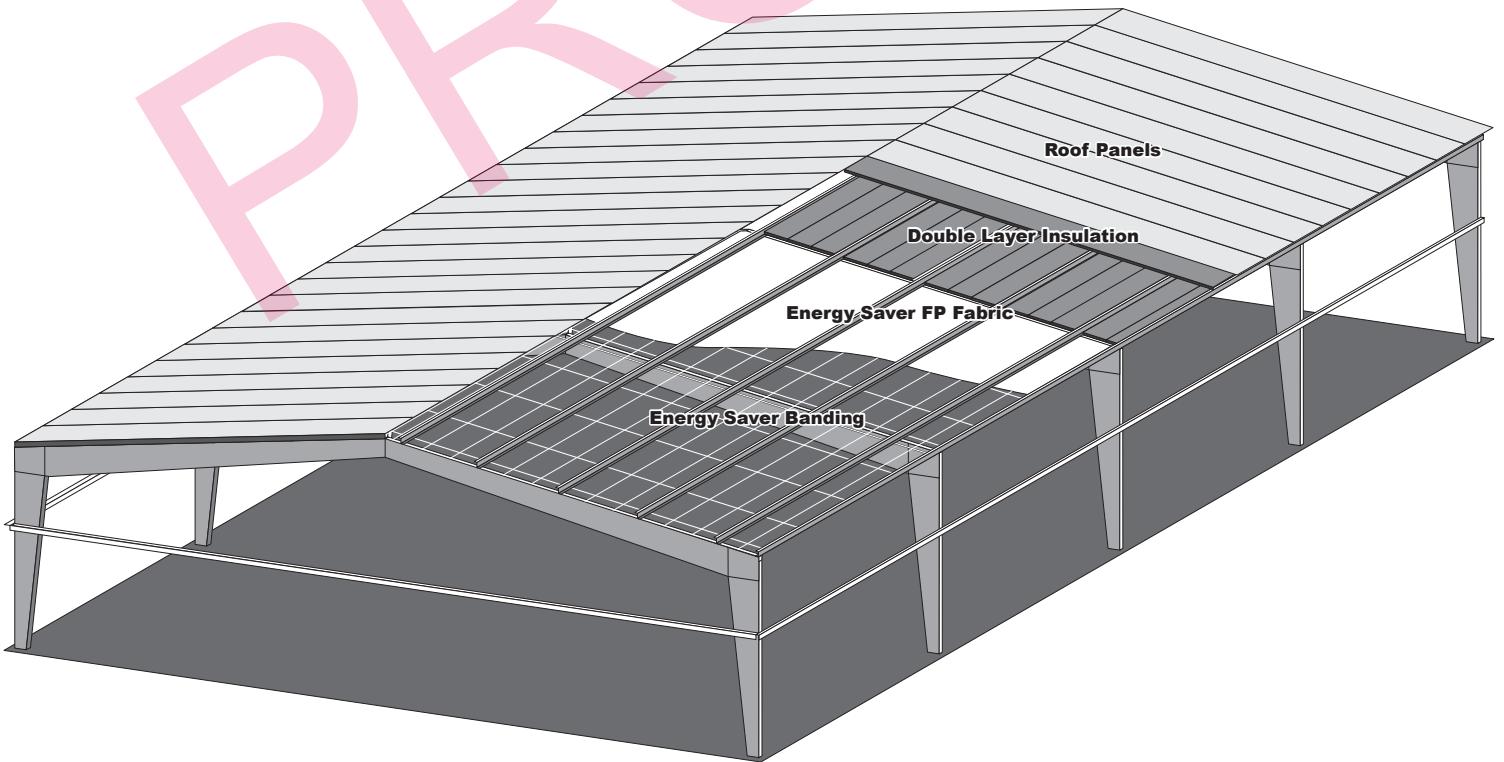
As with all pressure sensitive materials, this product should be tested thoroughly under end-use conditions to ensure it meets the requirements of the specific application. This product has not been assessed for medical applications.

NOTE

The data contained herein are furnished for information only and are believed to be reliable. We cannot assume responsibility for the results obtained by others over whose methods we have no control. It is the user's responsibility to determine suitability for the user's purpose of any production methods mentioned herein and to adopt such precautions as may be advisable for the protection of property and of persons against any hazards that may be involved in the handling and use thereof. In light of the foregoing, Silvercote, LLC and its affiliates ("Silvercote") specifically disclaims all warranties expressed or implied, including warranties of merchantability or fitness for a particular purpose, arising from sale or use of Silvercote's products. Silvercote specifically disclaims any liability for consequential or incidental damages of any kind, including lost profits. The discussion herein of various processes or compositions is not to be interpreted as representation that they are free from domination of patents owned by others or as a license. We recommend that each prospective user test his proposed application before repetitive use, using this data as a guide.

**PLEASE CONTACT YOUR SILVERCOTE SALES REPRESENTATIVE
FOR MORE INFORMATION AT (844) 232-3701 OR INFO@SILVERCOTE.COM**

Test Reports – Installation Instructions with Fall Protection



Roof Installation Guide

FOR NEW CONSTRUCTION

Be sure to read the entire instructions before you begin.

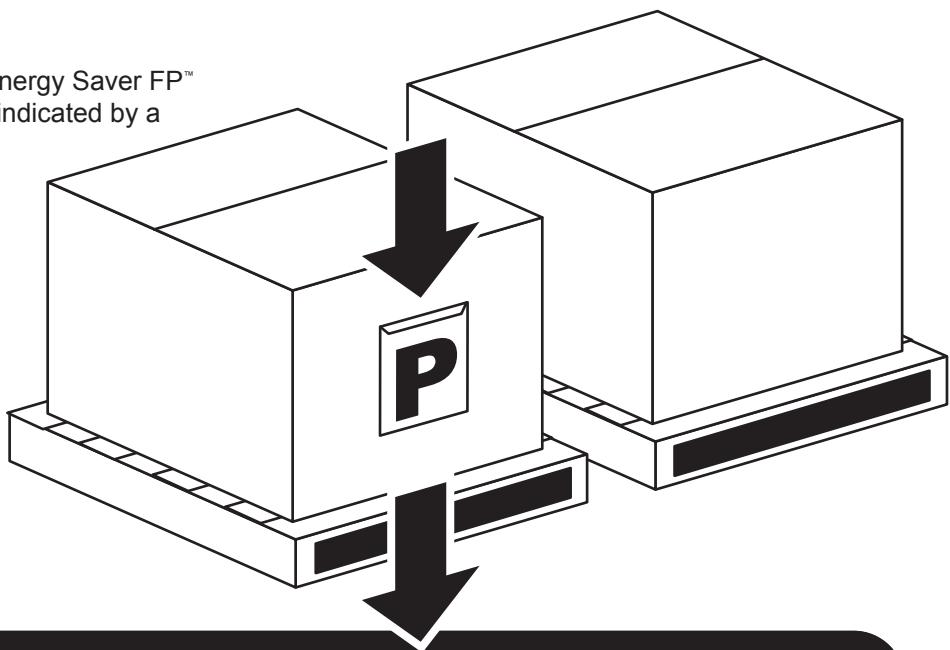
Before you begin:

Locate the shipping pallet that contains the Energy Saver FP™ System installation packet. The pallet will be indicated by a marked sticker.

It will contain:

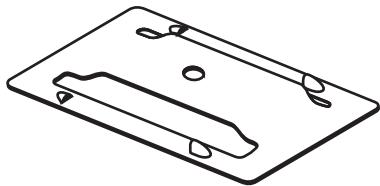
- *Jobsite Cutlist* - Used to inventory all Energy Saver fabric/components and unfaced insulation rolls. Additionally, it will indicate where the products are to be installed on your project.
- *Installation Instructions* - These will be used to explain the steps involved with the Energy Saver FP rooftop installation.
- *Packing Slip(s)* - The carrier's paperwork detailing delivered materials.

Please be sure to inventory all materials and mark any shortages.



The pallet(s) will also contain the accessories needed for the successful completion of the fabric liner system:

Energy Saver Banding Clips



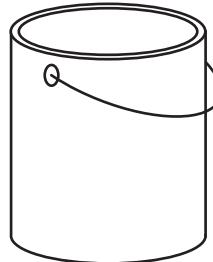
1 1/4" metal tek screws



3/4" metal tek screws with washer



1-gallon can(s) solvent-based adhesive



Applicator brush

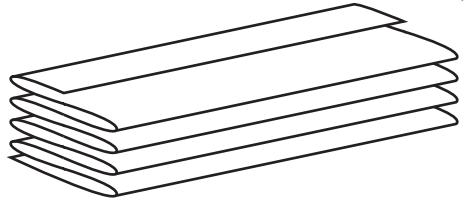


Patch tape

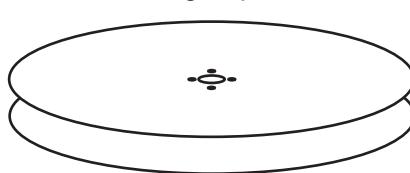


Energy Saver adhesive tape

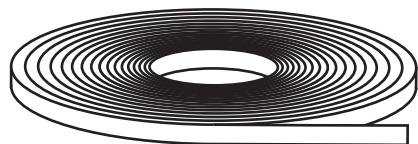
Energy Saver Fabric (bagged and labeled with size and installation locations)



Energy Saver banding dispenser



Energy Saver banding

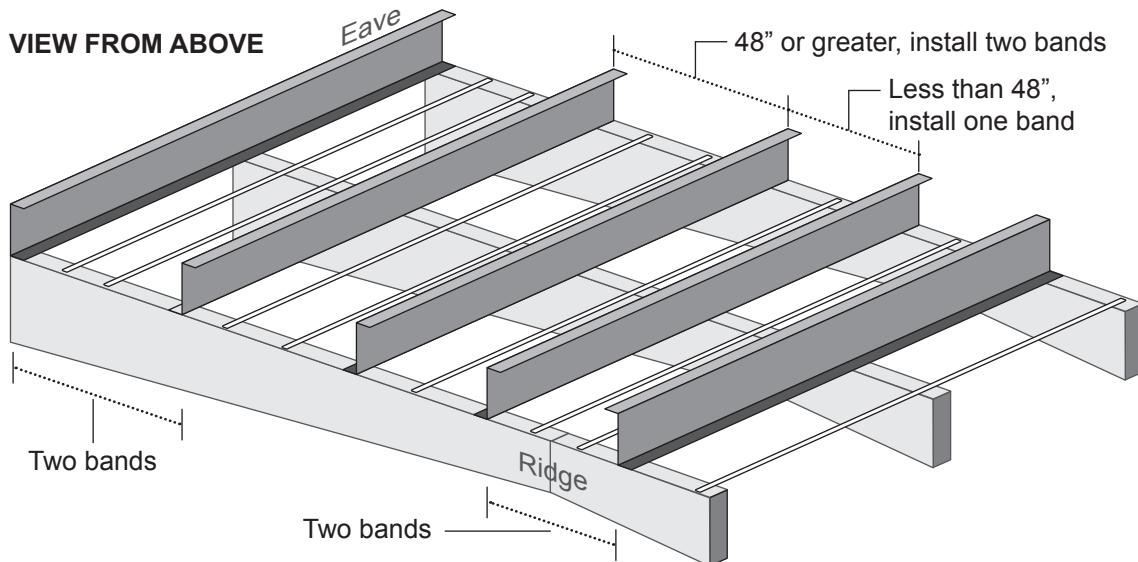


WARNINGS

- ! The Energy Saver FP system meets the requirements for leading edge fall protection for the assembly of metal decking/roofing under OSHA Title 29 C.F.R. § 1926.754 and OSHA Title 29 C.F.R. § 1926.502 when properly installed by a Silvercote certified installer, who is an OSHA "Qualified Person" as defined by OSHA Title 29 C.F.R. § 1926.751.
- ! The Energy Saver FP system provides fall protection at the leading edge only and is just one component of a total fall protection plan for the job. Other means of fall protection are still required within six feet (6') of any exterior roof edge, roof opening, or common rafter where the system has not been installed in both bays. Other means of fall protection must always be used with the Energy Saver FP system in those areas.
- ! The Energy Saver FP system is not intended to be stepped into or walked upon. The system is designed for only single-use leading edge fall protection. In the event of a fall, the Energy Saver FP fall protection system cannot be relied upon to provide leading edge fall protection or falling object protection until the fabric and banding are replaced with new components.
- ! The Energy Saver FP system is not recommended for high humidity applications and should never be used in buildings housing pools or open sources of water.
- ! If project includes Energy Saver walls, special consideration may be required at eave strut. See Energy Saver wall install instruction details.

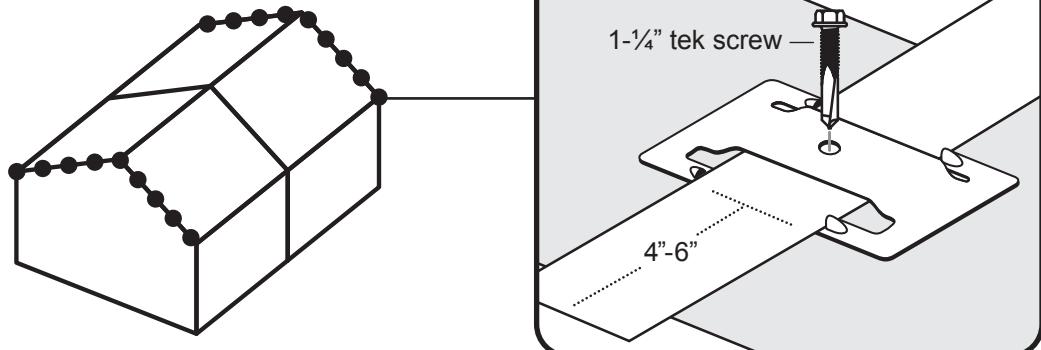
1. Parallel Banding Installation

1.1 Install a series of parallel (longitudinal) bands within each purlin space. It is required that two bands be installed in the eave and ridge spaces. For the remaining purlin spaces 48" or greater, install two bands per space; for purlin spaces less than 48", install one band per space.



WARNING

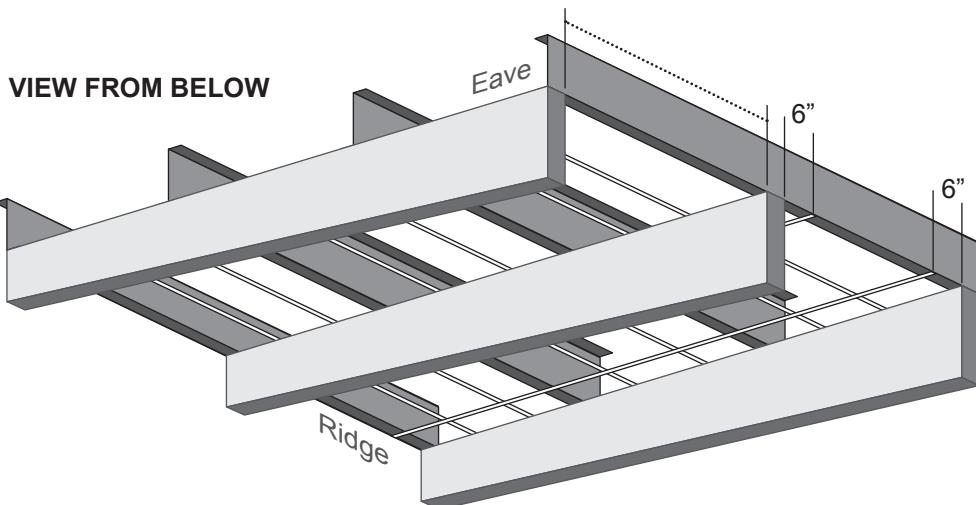
- !
 - If your project includes Energy Saver walls, special consideration may be required at eave strut for the roof and wall connection. Determine which wall system you are using then see appropriate technical connection detail available separately Energy Saver roof to Energy Saver wall or Energy Saver roof to MBI walls.
 - Do not splice parallel bands. If the banding is not long enough to install in one piece for the length of the building, follow the instructions in the Technical Detail at page 7 for the proper installation procedure.



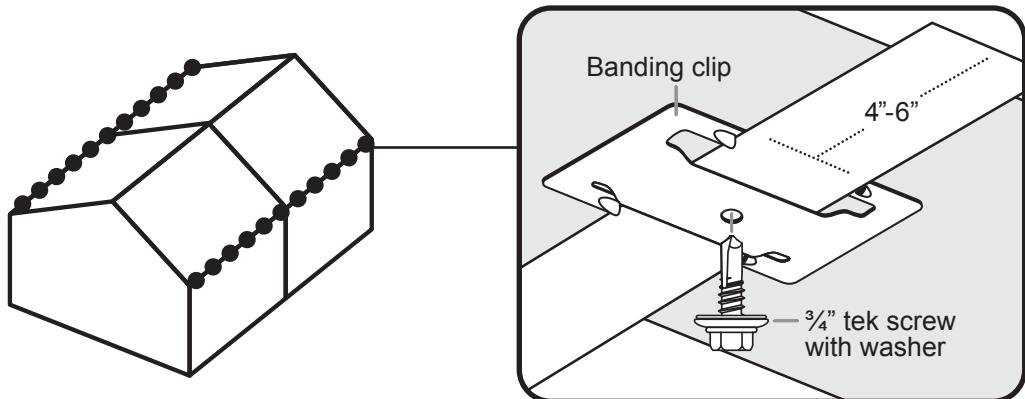
1.3 Fasten these bands to the top flange of endwall rafters only, using a single 1-1/4" metal tek screw and banding clip. Pull banding hand-tight to far endwall rafter and secure in the same manner as above.

*Do not fasten parallel bands to intermediate rafters, as the System will not offer leading edge fall protection. If parallel bands are not fastened to intermediate rafters, the system will offer leading edge fall protection within 6'0" of the rafters, provided that the System (fabric included) is completely installed in both bays sharing a common intermediate rafter.

2. Perpendicular Banding Installation



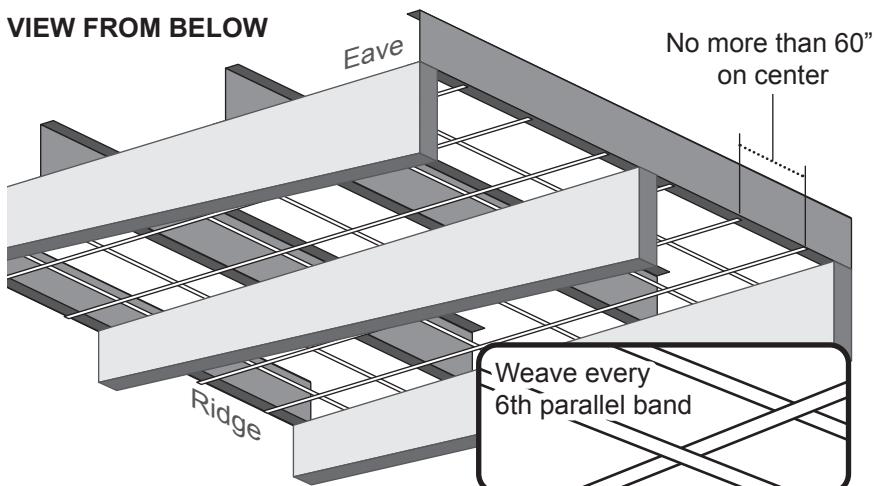
- 2.1** Starting exactly six (6") inches from the rafter edge install a series of perpendicular (cross) bands to the bottom flange of the eave strut.



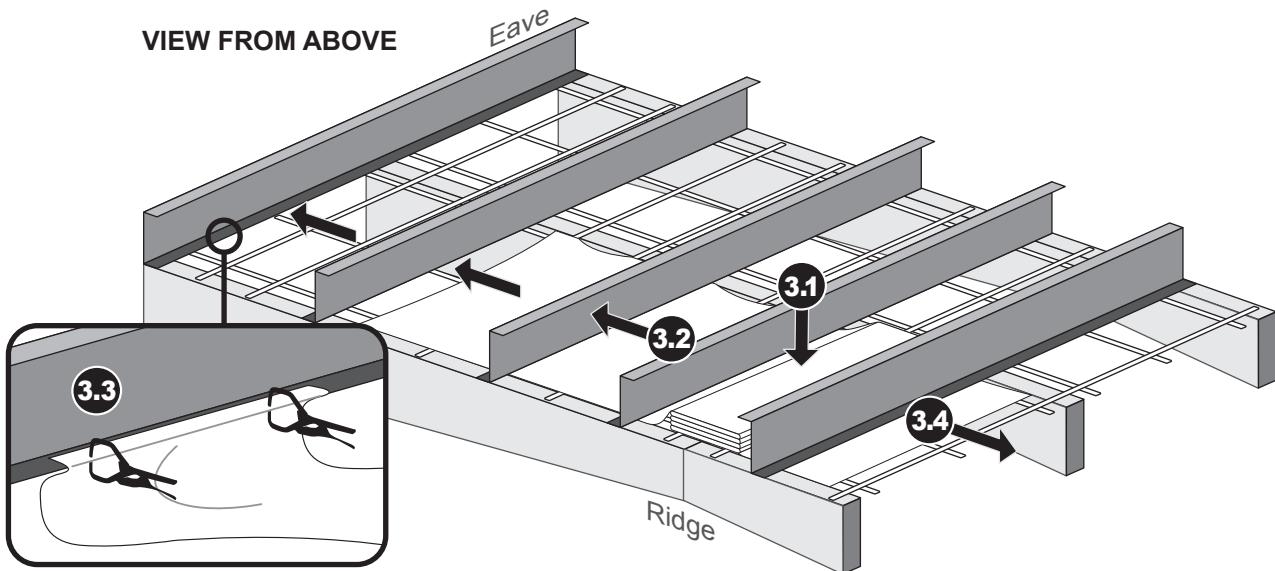
- 2.2** Fasten these bands to the bottom flange of the eave strut, using a single $\frac{3}{4}$ " metal tek screw and banding clip. Pull banding hand-tight while making sure to remove twists. Insert the steel banding through the banding clip and extend approximately 4-6" beyond the clip. The banding and clip should be fully secured, tightened, and flush with the surface (See Banding Clip detail for technical specifics).

- 2.3** Remaining perpendicular bands should be evenly spaced no more than 60" inches on center. Bands should be woven above every 6th parallel band and above both bands in the ridge space.

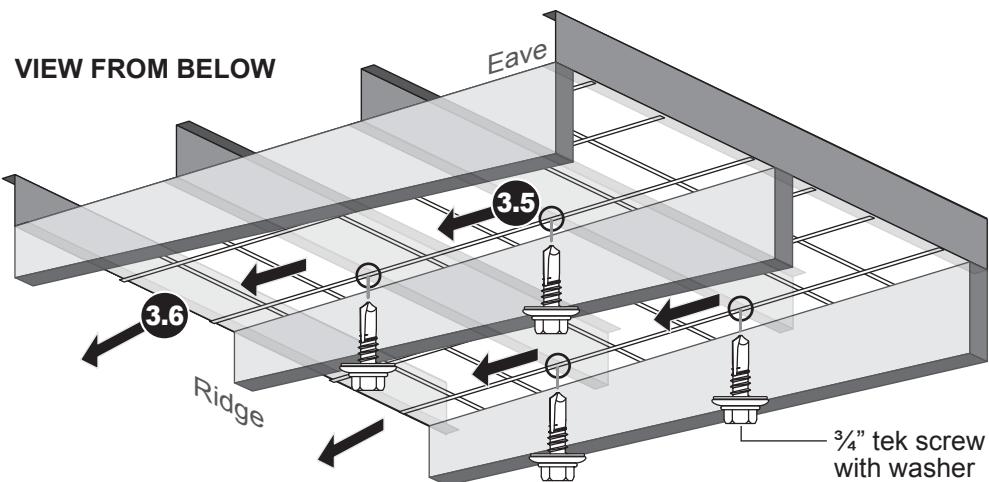
If perpendicular banding splicing is required, refer to Energy Saver Banding Field Splice Detail (in this document).



3. Fabric Installation



- NOTE: If installing on a single slope building, unwrap and position the fabric near the high side eave strut and repeat the above steps.

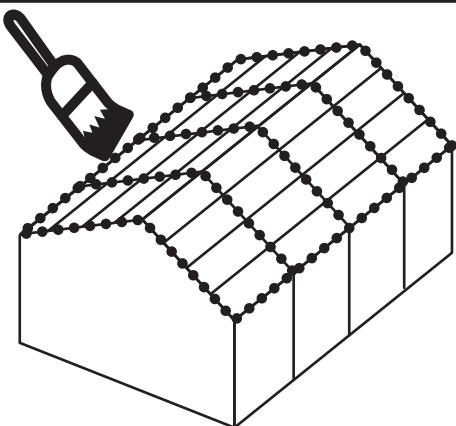
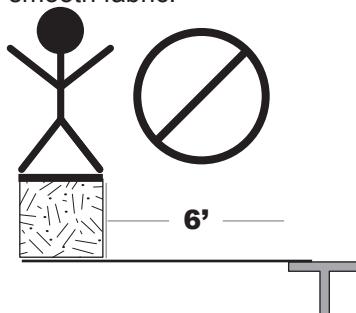


- 3.5 Once the fabric is smooth and square to the bay, proceed from the eave strut towards the ridge, screwing the perpendicular bands into the bottom of each intersected purlin with supplied $\frac{3}{4}$ " metal tek screw.
- 3.6 Continue to smooth the fabric throughout this process. If sheeting only one slope, the last fastener is installed into the far ridge purlin with a $\frac{3}{4}$ " TEK screw. If both slopes will be sheeted simultaneously, continue from the ridge down the opposing slope, stopping at the far eave strut.

3. Fabric Installation (continued)

3.7 To complete the fabric installation, remove fasteners, clips and banding at the eave strut, one bay at a time. Pull the fabric taught and apply Energy Saver adhesive or optional two-sided tape to the bottom of the eave strut and re-attach fabric using $\frac{3}{4}$ " metal tek screws and banding clips in the same holes where previously located. Adhesives must be applied to clean and dry surfaces. Finally, notch the fabric around the purlins and seal to the top of the rafters with brush adhesive or optional two-sided tape. This will be the final opportunity to tighten and smooth fabric.

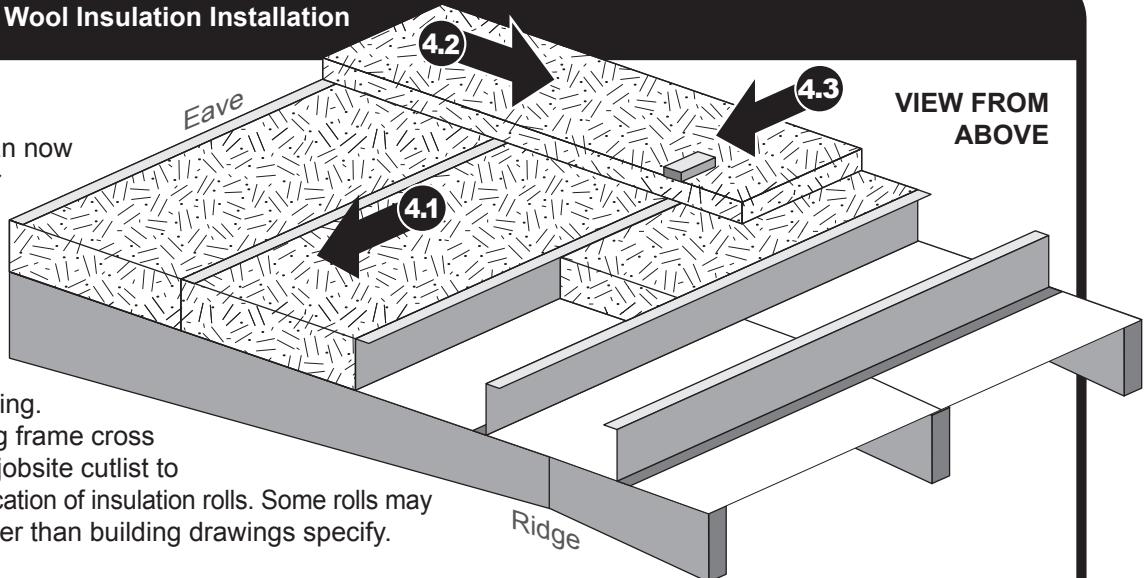
WARNING - The last 6 feet of intermediate bays does not have leading edge fall protection until adjacent bay is completed.



Some bay spaces may be wider than can be accommodated with a single piece of Energy Saver Fabric. If two pieces of fabric are required, please refer to the Silvercote Energy Saver fabric splicing detail in the TECHNICAL DETAILS section

4. Unfaced Glass Mineral Wool Insulation Installation

4.1 Unfaced insulation can now be installed on the liner fabric. The first/lower layer is installed within the purlin cavity and provided by Silvercote in custom cut widths, based on the building purlin spacing. Compare metal building frame cross sections with provided jobsite cutlist to determine the optimal location of insulation rolls. Some rolls may be supplied slightly wider than building drawings specify.



4.2 The second/top layer of unfaced insulation is now installed above the lower layer unfaced (perpendicular to the purlins), creating a thermal break below the metal roof panels.

4.3 If thermal blocks are required (not by Silvercote), install per building manufacturer's recommendations.

*Most industry experts believe that the space between the fabric and the outer metal panels should be fully filled with insulation in order to avoid potential condensation problems.

5. Metal Building Roofing Installation

5.1 Install roof steel and accessories per metal building manufacturer's recommendations.

TECHNICAL DETAILS

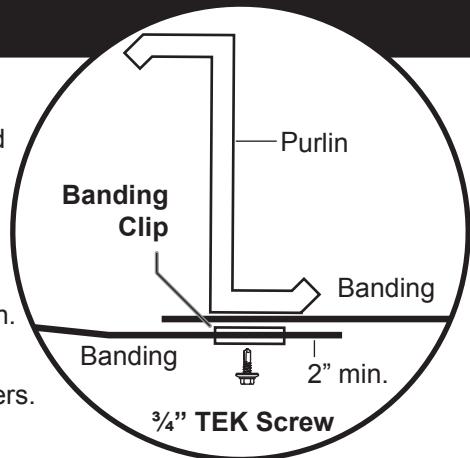
Perpendicular Banding Field Splice

Silvercote provides 1" white steel banding in 500' coil lengths. At times, field splicing this banding will be required due to the design width of a building.

Cross banding, installed sidewall to sidewall, can be field spliced by using a provided banding clip on the underside of a purlin. Install the bottom length of banding through the clip and drill a $\frac{3}{4}$ " TEK screw through the banding, banding clip, and through the upper length of banding into the purlin.

WARNING: Never splice banding within 10' of the eaves of a building, and never splice the cross band immediately adjacent to intermediate rafters.

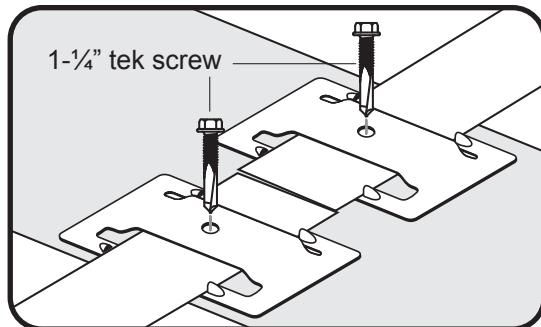
NOTE: White spray paint may be applied to the banding clip to improve appearance.



Parallel Banding Installation Supplement

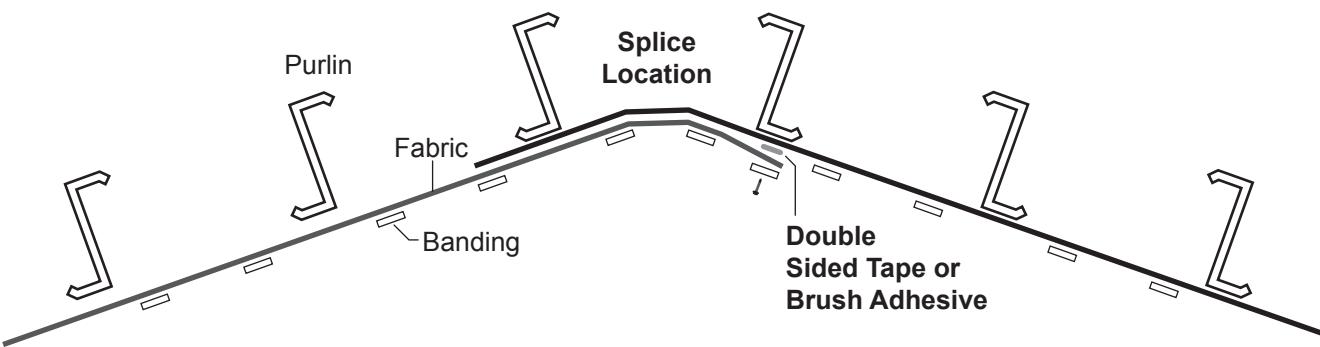
If Banding rolls are not long enough to install in one piece use the following method.

- Using a banding clip, install end of banding roll #1 to one side of the intermediate roof beam.
- Using a banding clip install end of banding roll #2 to the other side of the same roof beam. End at end wall.



Fabric Field Splice

In some instances, where a building is too wide for the Energy Saver FP fabric to be installed from eave to eave in one full piece, field splicing may be required. On a double slope building, this can be done at the first purlin down from the ridge. On a single slope building, the splice will be made at a pre-determined purlin, mid-slope.



TEK SCREW INSTALLATION GUIDELINES:

A standard screw gun with a depth sensitive nosepiece should be used to install Tek fasteners. For optimal fastener performance, the screw gun should be a minimum of 6 amps and have an RPM range of 0-2500 (maximum 1800 RPM is recommended for Teks 5 fasteners, which are the fasteners supplied for use with this clip).

Overdriving may result in torsional failure of the fastener or strip out of the substrate. The fastener must penetrate beyond the metal structure a minimum of 3 pitches of thread.

TECHNICAL DETAILS (continued)

BANDING CLIP DETAIL (U.S. Patent No. 8,015,769)

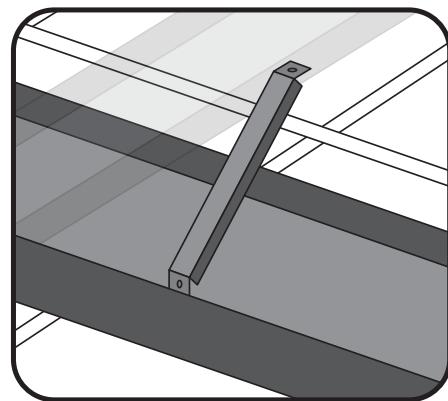
1. When installing both the cross banding and longitudinal banding, insert the 1" white steel banding through the Energy Saver Banding clip, leaving approximately 4" to 6" of extra banding. The fastener and the center fastening point of the banding clip must be flush with the surface of the beam and fully tightened (torqued to a minimum 150 in. lbs.). This will yield proper pull out strength by correctly compressing the banding against the steel framing.
2. Where the bands intersect the endwall rafters, drill the provided 1 1/4" TEK screw down through the clip, then through banding and into the building's endwall rafter.
3. Where the bands intersect the eave struts, drill the provided 3/4" TEK screw up through the clip, then through the banding and into the eave strut. Any cross band directly adjacent to a rafter must be spaced EXACTLY 6" from rafter edge. Remaining cross bands should be spaced on equal centers, no greater than 60" apart.

Note: Clips may be painted white to match the banding and underside of the Energy Saver FP System fabric if desired.

Note: The banding clip should be installed at the origination and termination point of each run of white galvanized steel banding around the perimeter of the building. The clips should be positioned so that the screw will first penetrate through the clip and then the banding using only one fastener. Do not install additional fasteners through clip or directly through banding. Each clip should be tightened as securely as possible (torqued to a minimum 150 in. lbs.), without stripping the threads. Longitudinal bands should be secured at endwall rafters only. Do not use fasteners to secure longitudinal bands to any interior rafters.

FLANGE BRACE ATTACHMENT

Many metal building manufacturers can accommodate requests for a modified attachment of the flange braces, which helps minimize penetrations to the Energy Saver FP fabric. We suggest you check with your supplier prior to ordering your building to see if something like the accompanying detail is available. Note that the flange brace to purlin connection is a critical detail that cannot be modified without approval from a qualified engineer.



Warranty

Energy Saver 10 Year Limited Warranty

What is Warranted and for How Long

Silvercote, LLC ("Silvercote"), subject to the terms and conditions below, warrants:

- (i) for a period of ten (10) years from the date of original proper installation that the materials provided by Silvercote for its Energy Saver FP System ("Product") are free from manufacturing defects of any materiality, when subject to normal and proper use, and is manufactured in all material respects to Silvercote's product specifications; and
- (ii) prior to installation that the Product will provide, on average, the purchased R-value, plus or minus five percent (5%)

Liability under this warranty is limited, at Silvercote's exclusive option, to Silvercote replacing defective Product without charge at the place of Silvercote's original delivery or, in the alternative, a refund of the original purchase price for such defective Product. In those instances in which Silvercote determines that only a portion of the Product manifests a defect, Silvercote reserves the right to limit any replacement or refund to the portion of the Product that manifests the defect.

Labor charges or other costs incurred with removal or installation of either the original or replacement Product are not covered by this warranty. In the event of replacement under the terms of this warranty, the original warranty shall apply to the replacement Product and will extend for the balance of the warranty period remaining at the time of replacement. Any Product considered to be defective should not be installed.

Who is Covered

Except where prohibited by state law, this limited warranty extends only to the original end-user customer and is non-transferable.

"Original end-user customer" means the original purchaser who contracts through a contractor for the original purchase and installation of the Product for his property, or the first buyer of a property that contains the Product as a new installation.

How to make a claim

In the event you believe that Product fails to conform to this warranty, you must notify Silvercote at 864-297-6101, promptly followed in writing at Silvercote, 25 Logue Ct., Greenville, SC 29615, Attention: Metal Building Claims Department. Such notice must be made within sixty (60) days of the date the claimed defect was first discovered or reasonably could have been discovered.

Written notice must include description of the alleged defect, a picture of the defective Product if possible, as well as proof of the date of purchase. Silvercote may then promptly inspect the Product.

If such examination does disclose a defect covered by this warranty, Silvercote will perform its obligations under this warranty to the extent of the Product that actually manifests defects. Silvercote reserves the right to inspect any Product that is alleged to be defective prior to its removal from the installation location. Silvercote will not be liable for any actions or expenditures incurred prior to written acknowledgement of Silvercote responsibility under this warranty.

Limitations

The Energy Saver FP support fabric contains UV stabilizers to improve its performance when exposed to UV light. Silvercote does not warrant the Energy Saver FP support fabric for failure due to deterioration from exposure of the fabric to UV light, heat or exposure to chemicals which can cause

rapid deterioration of the fabric resulting in flaking, brittleness and loss of strength.

This warranty is void under any of the following conditions:

1. Installation by a contractor not Silvercote certified, or improper installation of the Product pursuant to the training provided by Silvercote to the licensed and certified contractor.
2. The negligence, gross negligence or willful or intentional misconduct of any third party.
3. The presence of excessive moisture within the insulation cavity.
4. Defects in the structure or component of the structure in which the Product is installed, or premature deterioration of the building materials.
5. The Product fails, is rendered defective, or is damaged as a result of materials installed or stored near the Product.
6. The Product is damaged or a failure is caused by modifications not executed by Silvercote, impact from foreign objects, lightning, hurricane, tornado, earthquake or other acts of God, or by fire, explosion or other casualty.
7. The Product is deliberately damaged or damaged by abuse, vandalism or improper use.
8. Any other cause not involving manufacturing defects in the Product.

Purchasers of the Products are solely responsible for determining the effectiveness, suitability and safety of any particular use or application of the Product. Building code regulations vary from area to area. Purchasers should consult local building and safety codes for specific requirements.

Silvercote reserves the right to discontinue or modify any of its Products without notice to the purchaser. If Silvercote replaces any Product under this warranty, it may substitute Product designated by Silvercote to be of comparable quality in the event the Product initially installed has been discontinued or modified.

SILVERCOTE'S LIABILITY SHALL BE LIMITED SOLELY TO ITS RESPONSIBILITIES UNDER THIS WARRANTY. EXCEPT FOR THE EXPRESS WARRANTY DESCRIBED ABOVE, THERE ARE NO EXPRESS OR IMPLIED WARRANTIES OF ANY KIND AND THERE ARE NO WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE WITH RESPECT TO THE PRODUCT AND NO WARRANTY SHALL BE IMPLIED BY OPERATION OF LAW OR OTHERWISE. IN NO EVENT SHALL SILVERCOTE BE LIABLE FOR INDIRECT, SPECIAL, CONSEQUENTIAL OR INCIDENTAL DAMAGES OF ANY KIND, INCLUDING ANY DAMAGE TO THE BUILDING, ITS CONTENTS OR ANY PERSON. SOME STATES DO NOT ALLOW THE EXCLUSION OR LIMITATION OF INCIDENTAL OR CONSEQUENTIAL DAMAGES, SO THE ABOVE LIMITATION OR EXCLUSION MAY NOT APPLY TO YOU.

No variation or change in this warranty will be binding upon Silvercote unless made in writing and signed by an officer of Silvercote.

This warranty gives you specific legal rights and remedies, and you may also have other rights which vary from state to state.

This warranty shall only be applicable and enforceable in the United States of America and Canada.

07210 – Building Insulation
Submittal Package 01

Hilo WWTP, PH 1
Job No. WW-4705R

Safety Data Sheet (SDS) - Insulation

SAFETY DATA SHEET

Product name:	Glass Mineral Wool with ECOSE® Technology	Page:	1/13
Revision Date:	2015-04-30	Print date:	2015-05-22
P/N-no.:	KI_DP_101	SDS-ID:	US-EN/1.0

SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

Product identifier

Product name: Metal Building Insulation with ECOSE® Technology (Faced and Unfaced)

Revision: Date: 2015.04.30

Relevant identified uses of the substance or mixture and uses advised against

Identified uses: Thermal and/or acoustic insulation for use in technical applications, industrial applications and in building construction.

Uses advised against: None known.

Details of the supplier of the safety data sheet

Head Office Silvercote LLC
25 Logue Ct
Greenville
SC 29615

Region: United States, Central & South America's

Emergency telephone number

Emergency telephone: Within United States 24hour: Chemtree Tel: 800 424 9300

Product name:	Glass Mineral Wool with ECOSE® Technology	Page:	2/13
Revision Date:	2015-04-30	Print date:	2015-05-22
P/N-no.:	KI_DP_101	SDS-ID:	US-EN/1.0

SECTION 2: HAZARDS IDENTIFICATION

Classification of the substance or mixture

Classification according to the OSHA Hazard Communication Standard (29 CFR 1910.1200)
: The product is not classified.

Label elements

Contains: None.

Hazard pictogram: None.

Signal word: None.

Hazard statement: None.

Precautionary statements:

- Prevention: None.
- Response: None.
- Storage: None.
- Disposal: None.

Supplemental label information: None.

The following sentences and The mechanical effect of fibres in contact with skin may cause temporary itching.
pictograms are printed on
packaging:



Other hazards

None.

Hazard summary

Physical hazards: None.

Health hazards: Mechanical irritation of the skin, eyes and upper respiratory system.

Environmental hazards: None.

Main symptoms: Contact with skin, eyes and upper respiratory system may cause mechanical irritation.
Biosoluble glass mineral wool is classified as a nuisance dust by OSHA.

* Heat-Up Precautions: When heated to temperatures above 400°F for the first time, release of binder components and binder decomposition products can occur which, in high concentrations, may irritate eyes and the respiratory system. - see section 8 & 10

Product name:	Glass Mineral Wool with ECOSE® Technology	Page:	3/13
Revision Date:	2015-04-30	Print date:	2015-05-22
P/N-no.:	KI_DP_101	SDS-ID:	US-EN/1.0

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

Substances

<u>%:</u>	<u>CAS-No.:</u>	<u>Chemical name:</u>	<u>Hazard classification:</u>	<u>Notes:</u>
87-100	-	Biosoluble glass mineral wool	-	(1), (2), (3)
0-13	-	Thermo set, inert polymer bonding agent derived from plant starches	-	(1)
Notes:		<p>(1) Specific chemical identity and/or exact percent concentration is withheld as trade secret.</p> <p>(2) Man made vitreous (silicate) fibres with random orientation with alkaline oxide and alkali earth oxide ($\text{Na}_2\text{O}+\text{K}_2\text{O}+\text{CaO}+\text{MgO}+\text{BaO}$) content greater than 18% by weight meeting the requirements of Note Q of European regulation n° 1272/2008 and therefore not classified carcinogenicity.</p> <p>(3) All Knauf Insulation products covered by this SDS are independently certified by EUCEB to be manufactured using biosoluble glass formulations and thus exempt from labeling under NTP or California Prop 65 requirements.</p>		

SECTION 4: FIRST AID MEASURES

Description of first aid measures

General Information:

Show this Safety Data Sheet to the medical professional in attendance. If symptoms occur, follow first aid measures as appropriate.

Notes to Physician: None specific.

Inhalation: Remove from exposure. Rinse the throat and clear dust from airways.

Skin contact: If mechanical irritation occurs, remove contaminated clothing and wash skin gently with cold water and soap.

Eye contact: Rinse abundantly with water for at least 15 minutes.

Ingestion: Drink plenty of water if accidentally ingested.

Most important symptoms and effects, both acute and delayed

Contact with skin, eyes and upper respiratory system may cause mechanical irritation. Biosoluble glass mineral wool is classified as a nuisance dust by OSHA.

Indication of any immediate medical attention and special treatment needed

If any adverse reaction or discomfort continues from any of the above exposures, seek professional medical advice.

Medical attention/treatments: None specific.

Product name:	Glass Mineral Wool with ECOSE® Technology	Page:	4/13
Revision Date:	2015-04-30	Print date:	2015-05-22
P/N-no.:	KI_DP_101	SDS-ID:	US-EN/1.0

SECTION 5: FIREFIGHTING MEASURES

Extinguishing media

Water, foam, carbon dioxide (CO₂), and dry powder.

Special hazards arising from the substance or mixture

Products do not pose a fire hazard in use; however, some packaging materials or facings may be combustible. Products of combustion from product and packaging - carbon dioxide, carbon monoxide and some trace gases such as ammonia, nitrogen oxides and volatile organic substances.

Advice for firefighters

In large fires in poorly ventilated areas or involving packaging materials respiratory protection / breathing apparatus may be required.

SECTION 6: ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

Personal precautions: Minimise direct contact with skin in order to prevent mechanical itching. In dusty environments, use suitable respiratory protection such as 3M 8210, N95 or equivalent. Use glasses or goggles when working with mineral wool insulation above shoulder height or in dusty environments. Where possible, use natural ventilation during installation in order to minimise dust levels.

After contact with the product, rinse skin in cold water to reduce potential effects of mechanical itching. Dispose of surplus product in accordance with local regulations.

Emergency procedures: Use personal protection recommended in Section 8 of the SDS.

Environmental precautions

Not relevant.

Methods and material for containment and cleaning up

In dusty environments, use vacuum equipment where possible to minimise dust levels.

Reference to other sections

For personal protection, see section 8. For waste disposal, see section 13.

Product name:	Glass Mineral Wool with ECOSE® Technology	Page:	5/13
Revision Date:	2015-04-30	Print date:	2015-05-22
P/N-no.:	KI_DP_101	SDS-ID:	US-EN/1.0

SECTION 7: HANDLING AND STORAGE

Precautions for safe handling

Assure proper respiratory protection if dust potential exceeds PEL/TLV.

Conditions for safe storage, including any incompatibilities

To ensure optimum product performance; when packaging is removed or opened; products should be stored inside or covered to protect them from ingress of rain water or snow.

Storage arrangements should ensure stability of stacked products and use on a first in first out basis (FIFO) is recommended.

Specific end use(s)

Thermal and/or acoustic insulation for use in technical applications, industrial applications and in building construction.

Product name:	Glass Mineral Wool with ECOSE® Technology	Page:	6/13
Revision Date:	2015-04-30	Print date:	2015-05-22
P/N-no.:	KI_DP_101	SDS-ID:	US-EN/1.0

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

United States

Occupational exposure limits:

CAS-No.:	Chemical name:	As:	Exposure limits:	Type:	Notes:	References:
-	Glass wool fibers	-	1 fiber/ml	TWA	A3	ACGIH
-	Particulates not otherwise regulated (PNOR), respirable fraction	-	5 mg/m ³	TWA	-	OSHA
-	Particulates not otherwise regulated (PNOR), total dust	-	15 mg/m ³	TWA	-	OSHA

Notes: (A3) - Fibers longer than 5 µm; diameter less than 3 µm; aspect ratio greater than 5:1 as determined by the membrane filter method at 400-450X magnification (4-mm objective) phase contrast illumination.
- Biosoluble glass mineral wool fibre - see section 3

Exposure controls

Engineering measures: Maintain sufficient mechanical or natural ventilation to assure fiber concentrations remain below PEL/TLV. Use local exhaust if necessary. Power equipment should be equipped with properly designed dust collection devices.

Eye/face protection: Use glasses or goggles when working with mineral wool insulation above shoulder height or in dusty environments.

Skin protection: Minimise direct contact with skin in order to prevent mechanical itching.

Respiratory equipment: In dusty environments, use suitable respiratory protection.

Hygiene measures: After contact with the product, rinse skin in cold water to reduce potential effects of mechanical itching.

Environmental Exposure Controls: Not relevant.

* Heat-Up Precautions: When heated to temperatures above 400°F for the first time, release of binder components and binder decomposition products can occur which, in high concentrations, may irritate eyes and the respiratory system. The duration of release is dependant upon the thickness of the insulation, binder content and the temperature applied. Adequate ventilation should be provided. In confined spaces or where ventilation is not possible, occupants should wear appropriate self-contained breathing apparatus.

Product name:	Glass Mineral Wool with ECOSE® Technology	Page:	7/13
Revision Date:	2015-04-30	Print date:	2015-05-22
P/N-no.:	KI_DP_101	SDS-ID:	US-EN/1.0

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

<u>Appearance:</u>	Solid.
<u>Form:</u>	Rolls., loose fibre, Panel.
<u>Colour:</u>	Brown.
<u>Odor:</u>	Not relevant.
<u>Odor threshold:</u>	Not relevant.
<u>pH:</u>	Not relevant.
<u>Melting point / freezing point:</u>	Not relevant.
<u>Initial boiling point and boiling range:</u>	Not relevant.
<u>Flash point:</u>	Not relevant.
<u>Auto Ignition Temperature (°F)</u>	Not relevant.
<u>Flammability (solid, gas):</u>	Not relevant.
<u>Flammability limit - lower (%):</u>	Not relevant.
<u>Flammability limit - upper (%):</u>	Not relevant.
<u>Vapor pressure:</u>	Not relevant.
<u>Vapor density:</u>	Not relevant.
<u>Evaporation rate:</u>	Not relevant.
<u>Relative density:</u>	9 - 35 kg/m ³
<u>Partition coefficient (n-octanol/water):</u>	Not relevant.
<u>Solubility:</u>	Generally chemically inert and insoluble in water.
<u>Decomposition Temperature (°F)</u>	Not relevant.
<u>Viscosity:</u>	Not relevant.
<u>Other data:</u>	Nominal diameter of fibres. 3 - 5 µm Length weight geometric mean diameter less 2 standard errors: < 6 µm Orientation of fibres: Random.

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SECTION 10: STABILITY AND REACTIVITY

Reactivity

None.

Chemical stability

Binder will decompose above 400°F

Possibility of hazardous reactions

None.

Conditions to avoid

Heating above 400°F

Incompatible materials

Incompatible materials: Hydrofluoric acid will react with and dissolve glass.

Hazardous decomposition products

None in normal conditions of use.

* Heat-Up Precautions:

When heated to temperatures above 400°F for the first time, release of binder components and binder decomposition products can occur which, in high concentrations, may irritate eyes and the respiratory system. The duration of release is dependant upon the thickness of the insulation, binder content and the temperature applied. Adequate ventilation should be provided. In confined spaces or where ventilation is not possible, occupants should wear appropriate self-contained breathing apparatus.

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SECTION 11: TOXICOLOGICAL INFORMATION

Information on toxicological effects

Ingestion: Non-hazardous when ingested.
Inhalation: Mechanical irritation to upper respiratory tract.
Skin contact: Mechanical irritation to skin.
Eye contact: Mechanical irritation to eyes.
Symptoms: Contact with skin, eyes and upper respiratory system may cause mechanical irritation.
Biosoluble glass mineral wool is classified as a nuisance dust by OSHA.

Information on toxicological effects:

Acute toxicity: No data were identified for the product as a whole. Data are for constituents:

Product name: Thermo set, inert polymer bonding agent derived from plant starches.
Result - LD50

Species - n/a

Dose - n/a

Exposure - n/a

Product name: Biosoluble glass mineral wool

Result - LD50

Species - n/a

Dose - n/a

Exposure - n/a

Serious eye damage/irritation: May cause mechanical irritation to eyes.
Skin Corrosion/Irritation: May cause mechanical irritation to skin.
Respiratory or skin sensitization: No data were identified for this product or its constituents.
Germ cell mutagenicity: No data were identified for this product or its constituents.
Carcinogenicity: Results from a biopersistence test by intratracheal instillation has shown that fibers in this product longer than 20 µm have a weighted half-life less than 40 days, thus this product is not classified as a carcinogen. None of the components of this product are listed as a carcinogen by OSHA, IARC or NTP.

Reproductive Toxicity: No data were identified for this product or its constituents.

Developmental Effects: No data were identified for this product or its constituents.

STOT - Single exposure: No data were identified for this product or its constituents.

STOT - Repeated exposure: No data were identified for this product or its constituents.

Aspiration hazard: Not relevant.

Product name:	Glass Mineral Wool with ECOSE® Technology	Page:	10/13
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P/N-no.:	KI_DP_101	SDS-ID:	US-EN/1.0

SECTION 12: ECOLOGICAL INFORMATION

Toxicity

Ecotoxicity: This product is not ecotoxic to air, water or soil, by composition.

Persistence and degradability

Inert inorganic product with Thermo set, inert polymer bonding agent derived from plant starches; 0 - 13%

Bioaccumulative potential

Will not bio-accumulate.

Mobility in soil

Not considered mobile. Less than 1% leachable organic carbon if landfilled.

Results of PBT and vPvB assessment

Not relevant.

Other adverse effects

None known.

SECTION 13: DISPOSAL CONSIDERATIONS

Waste treatment methods

Waste from residues: Dispose of in accordance with all applicable regulations.

Contaminated packaging: Empty containers should be taken to an approved waste handling site for recycling or disposal.

Disposal methods: This product is not regulated under RCRA Hazardous Waste Regulations. May be disposed in landfill. If unsure, contact the local office of the USEPA, your local public health department or the local landfill regulators.

Product name:	Glass Mineral Wool with ECOSE® Technology	Page:	11/13
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SECTION 14: TRANSPORT INFORMATION

UN number

Not regulated.

UN proper shipping name

Not regulated.

Transport hazard class(es)

Not regulated.

Packing group

Not regulated.

Environmental hazards

Not regulated.

Special precautions for user

Not regulated.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Not regulated.

Product name:	Glass Mineral Wool with ECOSE® Technology	Page:	12/13
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P/N-no.:	KI_DP_101	SDS-ID:	US-EN/1.0

SECTION 15: REGULATORY INFORMATION

Safety, health and environmental regulations/legislation specific for the substance or mixture

OSHA Status: This product is regulated as a nuisance dust under OSHA criteria. Classified as not hazardous.

TSCA listed: All components of this product are listed or exempt from listing on the TSCA inventory.

CERCLA Reportable Quantity: Not regulated.

SARA Title III:

Section 302 Extremely Hazardous: Not regulated.

Section 311/312 Hazard Categories: Not regulated.

Section 313 Toxic Chemicals: Not listed.

California Safe Drinking Water and Toxic Enforcement Act (Prop. 65): This product is exempt from labeling requirements under this Act.

In accordance with industry practice, Knauf Insulation has decided to continue to provide its customers with the appropriate information for the purpose of assuring safe handling and use of mineral wool throughout the product life.

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SECTION 16: OTHER INFORMATION

Label in accordance with OSHA HCS (2012): This product is not classified as hazardous.

Abbreviations and acronyms used in the safety data sheet:

CAS: Chemical Abstract Service

CFR: Code of Federal Regulations

EUCEB: European Certification Board for Mineral Wool Products

IARC: International Agency for Research on Cancer

NTP: National Toxicology Program

OSHA: Occupational Safety and Health Administration (United States)

PEL: Permissible Exposure Limit

PBT: Persistent, Bioaccumulative and Toxic

SARA: Superfund Amendments and Reauthorization Act

SDS: Safety Data Sheet

STEL: Short Term Exposure Limit

TLV: Threshold Limit Value

TSCA: Toxic Substances Control Act

USEPA: United States Environmental Protection Agency

All products manufactured by Knauf Insulation are made of non-classified fibres and are certified by EUCEB.

Products meeting EUCEB certification requirements can be recognised by the EUCEB logo printed on the packaging.

Further information can be obtained from:

www.euceb.org

www.knaufinsulation.com



Additional information:

Change to Sections: New document format

Moreover, in 2001, the IARC, reclassified glass mineral wool fibres from Group 2B (possibly carcinogenic) to «not classifiable as to their carcinogenicity to humans (Group 3)». (See Monograph Vol 81, <http://monographs.iarc.fr/>).

The information on this data sheet represents our current data and is reliable provided that the product is used under the prescribed conditions and in accordance with the application specified on the packaging and/or in the technical guidance literature. Any other use of the product which involves using the product in combination with any other product or any other process is the responsibility of the user.

Safety Data Sheet (SDS) – Silvercote ES Fabric

ARTICLE DOCUMENT

The products listed below are defined as 'articles', which are exempt from OSHA Safety Data Sheet (SDS) requirements. Therefore, SDS have not been constructed for them. These products should not present a health or safety hazard under recommended or normal use. However, misuse of these products may affect product performance or present a potential health and safety hazard. This document was constructed as a courtesy for customers.

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name: Energy Saver Fabric

Product Type: Membrane structure fabric, brattice, vapour retarder.

Restriction of use: None identified

Company Address:

Silvercote
25 Logue Ct
Greenville SC 29615

Region: United States

Contact Information:

1) TRANSPORT EMERGENCIES:

CHEMTRAC USA:

800-424-9300 (24 hours)

CHEMTRAC International:

703-527-3887 (call collect)

Internet: www.Silvercote.com

2. COMPOSITION/INFORMATION ON INGREDIENTS

Ingredient	C.A.S. Number	Weight (%)
Polyethylene	NonE	100

3. HAZARDS IDENTIFICATION

These products should not present a health or safety hazard under recommended or normal use. Products contain minor levels of a proprietary flame retardant, partially composed of antimony trioxide and an organo-bromine compound, which is locked in the matrix of the fabric. The flame retardant does not contain Decabromodiphenyl Ether (decaBDE).

It is recommended that these products not be used for the collection and/or containment of potable water. Direct contact with food should also be avoided. Coloured and printed fabrics contain small quantities of proprietary pigments that may be health hazards in concentrated form. Contained in the matrix of the fabric, they do not make the fabric hazardous.

Eye/Skin contact:	Prolonged and/or repetitive contact can cause abrasion and irritation. Contact with molten product will burn unprotected skin and eyes. Should a burn occur, cool burn area immediately with cool, clean, running water until no heat is emitted from burn area. Cover with light, dry dressing. Do not apply oily ointments or puncture blisters. Obtain medical assistance.
Inhalation:	Avoid breathing dust, it may cause irritation if exposure is prolonged or excessive.
Ingestion:	Products should not be eaten, nor used as food wrapping. May cause irritation to throat, mouth and stomach.

4. FIRST AID MEASURES

If in contact with hot or molten plastic, treat the affected area with cool water and seek medical attention.

5. FIRE FIGHTING MEASURES

Flash point:	Not applicable
Flammable limits – LEL:	Not applicable
Flammable limits – UEL:	Not applicable
Auto ignition temperature:	Not applicable
Extinguishing media:	Water Spray, Dry Chemical, Foam
Special firefighting procedures:	Wear full protective equipment and a self-contained breathing apparatus.
Unusual fire and explosion hazards:	IPG FRU and FRU polyethylene fabrics are flame retardant, but will melt and/or char when exposed to heat or open flame. Avoid contact with molten, dripping plastic. When heated to decomposition, product emits acrid smoke and irritating fumes.

6. FACCIDENTAL RELEASE MEASURES

Personal precautions, protective	Not applicable
Environmental precautions:	Not applicable
Cleanup methods and materials:	Not applicable

7. HANDLING AND STORAGE

Safe handling:	Products may be slippery to walk on when wet. Charges of static electricity may be generated during handling and processing
Safe storage:	Products are best kept in weather-tight conditions and not exposed to sunlight during storage.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure limits:	Not applicable
Engineering controls:	Not applicable
Eye protection:	Not applicable
Skin protection:	Gloves recommended in cases of repetitive contact, such as sewing operations.
Respiratory protection:	Not required under normal use conditions

9. PHYSICAL AND CHEMICAL PROPERTIES

Auto ignition temperature:	Not applicable
Boiling point:	Not applicable
Color:	Varies by product
Density:	Not applicable
Evaporation rate:	Not applicable
Flash point:	Not applicable
Melting point:	Not applicable
Physical form:	Solid
pH:	Not applicable
Solubility in water:	Nil
Specific gravity:	Not applicable
Vapor density:	Not applicable
Vapor pressure:	Not applicable
Viscosity:	Not applicable
Volatile percent:	Not applicable

10. STABILITY AND REACTIVITY

Stability:	Stable
Conditions to avoid:	Temperatures above 80°C (175°F)
Materials to avoid:	Consult manufacturer before using as containment as a barrier for chemicals other than water. Very slightly reactive with oxidizing agents, acids, alkalis.
Hazardous polymerization:	Not anticipated under normal use
Hazardous decomposition:	Carbon monoxide, carbon dioxide, oxides of nitrogen and hydrocarbons may be generated during thermal decomposition and combustion.

11. TOXICOLOGICAL INFORMATION

Exposure to hazardous chemicals is not anticipated with normal use

12. ECOLOGICAL INFORMATION

Not applicable

13. DISPOSAL INFORMATION

Waste product can be recycled where facilities exist, disposed of in a sanitary landfill or incinerated.
Check local regulations before disposal.

14. TRANSPORT INFORMATION

These products are not regulated per U.S. DOT, IATA or IMO. Check local regulations before disposal.

15. REGULATORY INFORMATION

Chemical inventories:	These products are articles as per TSCA regulations, and therefore exempt from TSCA Inventory listing requirements.
U.S. Federal regulations:	Contact Silvercote
State regulations:	Contact Silvercote
International regulations:	Contact Silvercote

16. OTHER INFORMATION

National Fire Protection Association (NFPA) Hazard Classification			
Health: 0	Flammability: 1	Reactivity: 0	Special hazards: none

The information in this Article Document is believed to be correct as of the date issued. Silvercote makes no warranties, expressed or implied, including, but not limited to, any implied warranty of merchantability or fitness for a particular purpose or course of performance or usage of trade. User is responsible for determining whether the product is fit for a particular purpose and suitable for user's method of use or application. Given the variety of factors that can affect the use and application of a product, some of which are uniquely within the user's knowledge and control, it is essential that the user evaluate the product to determine whether it is fit for a particular purpose and suitable for user's method of use or application.

Safety Data Sheet (SDS) - Adhesives

SAFETY DATA SHEET

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name: Energy Saver Fabric Adhesive

Product Type: Adhesive

Restriction of use: None identified

Company Address:

Silvercote
25 Logue Ct
Greenville SC 29615

Region: United States

Contact Information:

1) TRANSPORT EMERGENCIES:

CHEMTREC USA:

800-424-9300 (24 hours)

CHEMTREC International:

703-527-3887 (call collect)

Internet: www.Silvercote.com

2. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW

DANGER: HIGHLY FLAMMABLE LIQUID AND VAPOR.
MAY BE FATAL IF SWALLOWED AND ENTERS AIRWAYS.
CAUSES SKIN IRRITATION.
MAY CAUSE AN ALLERGIC SKIN REACTION.
CAUSES SERIOUS EYE IRRITATION.
SUSPECTED OF DAMAGING FERTILITY OR THE UNBORN CHILD.
CAUSES DAMAGE TO ORGANS.
MAY CAUSE DAMAGE TO ORGANS THROUGH PROLONGED OR REPEATED EXPOSURE.

HAZARD CLASS

HAZARD CLASS	HAZARD CATEGORY
FLAMMABLE LIQUID.....	2
SKIN IRRITATION	2
EYE IRRITATION	2A
SKIN SENSITIZATION	1
REPRODUCTIVE TOXICITY.....	2
SPECIFIC TARGET ORGAN TOXICITY - SINGLE EXPOSURE.....	3
SPECIFIC TARGET ORGAN TOXICITY - REPEATED EXPOSURE.....	2
ASPIRATION HAZARD	1

PICTOGRAM(S)



PRECAUTIONARY STATEMENTS

Prevention: Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Keep away from heat, sparks, open flames, hot surfaces - no smoking. Keep container tightly closed. No release into water. Use explosion-proof equipment. Use nonsparking tools. Take action to prevent static discharges. Do not breathe vapors, mist, or spray. Wash affected area thoroughly after handling. Do not eat, drink or smoke when using this product. Contaminated work clothing should not be allowed out of the workplace. Wear protective gloves, clothing, eye and face protection.

Response: IF SWALLOWED: Immediately call a physician or poison control center. If on skin (or hair): Take off immediately all contaminated clothing. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If exposed: Call a poison center or physician. Do NOT induce vomiting. If skin irritation or rash occurs: Get medical attention. If eye irritation persists: Get medical attention. Take off contaminated clothing. In case of fire: Use foam, dry chemical or carbon dioxide to extinguish.

Storage: Store in a well-ventilated place. Keep cool. Store locked up.

Disposal: Dispose of contents and/or container according to Federal, State/Provincial and local governmental regulations.

Classification complies with OSHA Hazard Communication Standard (29 CFR 1910.1200) and is consistent with the provisions of the United Nations Globally Harmonized System of Classification and Labeling of Chemicals (GHS).

See Section 11 for additional toxicological information.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Hazardous Component(s)	CAS Number	Percentage*
Toluene	108-88-3	30-60
Modified rosin ester	Unknown	5-10
Heptane, branched, cyclic and linear	426260-76-6	5-10
Tris(nonylphenyl) phosphite	26523-78-4	0.1 - 1

*Exact percentage is a trade secret. Concentration range is provided to assist users in providing appropriate protections.

4. FIRST AID MEASURES

Inhalation:	Move to fresh air. If breathing is difficult, give oxygen. If not breathing, give artificial respiration. Get medical attention.
Skin contact:	Immediately flush skin with plenty of water (using soap, if available). Remove contaminated clothing and footwear. Get medical attention.
Eye contact:	Check for and remove any contact lenses. Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Get medical attention.
Ingestion	If material is ingested, immediately contact a physician or poison control center. DO NOT induce vomiting unless directed to do so by medical personnel. If vomiting occurs, prevent aspiration by keeping the patient's head below the knees. Never give anything by mouth to an unconscious person.
Symptoms:	See Section 11.

5. FIREFIGHTING MEASURES

Extinguishing media:	Use extinguishing measures appropriate to local circumstances and the surrounding environment. Water spray (fog), foam, dry chemical or carbon dioxide.
Special firefighting procedures:	Wear self-contained breathing apparatus and full protective clothing, such as turn-out gear. Isolate area. Keep unnecessary personnel away.
Unusual fire or explosion hazards:	Vapors may accumulate in low or confined areas, travel considerable distance to source of ignition, and flash back. Closed containers may rupture (due to build up of pressure) when exposed to extreme heat.
Hazardous combustion products:	Irritating and toxic gases or fumes may be released during a fire. Oxides of carbon.

6. ACCIDENTAL RELEASE MEASURES

Use personal protection recommended in Section 8, isolate the hazard area and deny entry to unnecessary and unprotected personnel.

Environmental precautions:	Prevent further leakage or spillage if safe to do so. Do not allow material to contaminate ground water system.
Clean-up methods:	Isolate area. Keep unnecessary personnel away. Eliminate all ignition sources (flames, hot surfaces, and sources of electrical, static or frictional sparks). Dike and contain spill with inert material (e.g. sand, earth). Transfer liquids to covered metal containers for recovery or disposal, or remove with inert absorbent. Use only non-sparking tools. Place absorbent diking materials in covered metal containers for disposal. Prevent contamination of sewers, streams and groundwater with spilled material or used absorbent.

7. HANDLING AND STORAGE

Handling:

Make sure containers are properly grounded before use or transfer of material. Keep container closed. Do not breathe gas/fumes/vapor/spray. Use only with adequate ventilation. Avoid contact with eyes, skin and clothing. Wash thoroughly after handling. Do not taste or swallow. Do not handle or store near an open flame, heat or other sources of ignition. "Empty" containers retain product residue (liquid and/or vapor) and can be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose such containers to heat, flame, sparks, static electricity, or other sources of ignition; they may explode.

Storage:

Keep in a cool, well ventilated area away from heat, sparks and open flame. Keep container tightly closed until ready for use. Ground and bond metal containers for liquid transfer to avoid static sparks.

For information on product shelf life, please review labels on container or check the Technical Data Sheet.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Employers should complete an assessment of all workplaces to determine the need for, and selection of, proper exposure controls and protective equipment for each task performed.

HAZARDOUS COMPONENT(S)	ACGIH TLV	OSHA PEL	AIHA WEEL	OTHER
Toluene	20 ppm TWA	200 ppm TWA 300 ppm Ceiling 500 ppm MAX. CONC. 10 minutes	None	None
Modified rosin ester	None	None	None	None
Heptane, branched, cyclic and linear	400 ppm TWA 500 ppm STEL	500 ppm (2,000 mg/m ³) PEL	None	None
Tris(nonylphenyl) phosphite	None	None	None	None

Engineering controls:

Work should be done in an adequately ventilated area (i.e., ventilation sufficient to maintain concentrations below one half of the PEL and other relevant standards). Local exhaust ventilation is recommended when general ventilation is not sufficient to control airborne contamination.

Respiratory protection:

Do not inhale vapors and fumes. Use NIOSH approved respirator if there is potential to exceed exposure limit(s).

Eye/face protection:

Safety goggles or safety glasses with side shields. Full face protection should be used if the potential for splashing or spraying of product exists.

Skin protection:

Use impermeable gloves and protective clothing as necessary to prevent skin contact. Safety showers and eye wash stations should be available.

9. PHYSICAL AND CHEMICAL PROPERTIES

Physical state:	Liquid
Color:	Amber
Odor:	Hydrocarbon-like, Solvent
Odor threshold:	Not available
pH:	Not applicable
Vapor pressure:	Not available
Boiling point/range:	> 60 - < 100 °C (> 140°F - < 212°F)
Melting point/range:	Not available
Specific gravity:	0.91
Vapor density:	Heavier than air
Flash point:	< -6.67° C (< 19.99° F) Cleveland open cup
Flammable/Explosive limits - lower:	1.2 % (Toluene)
Flammable/Explosive limits - upper:	7.1 % (Toluene)
Autoignition temperature:	Not available
Evaporation rate:	Not available
Solubility in water	Insoluble
Partition coefficient (n-octanol/water):	Not available
VOC content:	41.77 % (calculated)
Viscosity:	Not available

10. STABILITY AND REACTIVITY

Stability:	Stable under recommended storage conditions.
Hazardous reactions:	None expected.
Hazardous decomposition products:	Irritating and toxic gases or fumes may be released during a fire. Oxides of carbon.
Incompatible materials:	Strong acids, alkalies and oxidizing agents.
Reactivity:	This product may react with strong acids, bases and oxidizing agents.
Conditions to avoid:	Heat, flames, sparks and other sources of ignition. Take measures to prevent the build-up of electrostatic charges.

11. TOXICOLOGICAL INFORMATION

Relevant routes of exposure:	Skin, inhalation, eyes, ingestion
Potential Health Effects/Symptoms	
Skin contact:	Causes skin irritation. Symptoms may include redness, edema, drying, defatting and cracking of the skin. May cause allergic skin reaction in susceptible individuals.
Inhalation:	Causes respiratory tract irritation. The solvent vapors can be harmful and cause headache, nausea, and intoxication. Reports have associated repeated and prolonged overexposure to solvents with permanent brain and nervous system damage. Chronic exposure to toluene may have effects on the central nervous system and these effects may progress to be irreversible. Intentional misuse of toluene has resulted in reproductive effects including physical and developmental abnormalities.
Eye contact:	Causes eye irritation. Prolonged eye contact may cause severe eye damage.
Ingestion:	Not expected under normal conditions of use. May cause gastrointestinal tract irritation if swallowed. Aspirated material can enter the lungs and result in pneumonitis. Ingestion of this product may result in central nervous system effects including headache, sleepiness, dizziness, slurred speech and blurred vision.

HAZARDOUS COMPONENT(S)	LD50S AND LC50S	IMMEDIATE AND DELAYED HEALTH EFFECTS
Toluene	Oral LD50 (RAT) = 2.6 g/kg Oral LD50 (RAT) = 5,000 mg/kg Dermal LD50 (RABBIT) = 12,124 mg/kg Inhalation LC50 (RAT, 4 h) = 8000 ppm	Behavioral, Cardiac, Central nervous system, Developmental, Ear, Irritant
Modified rosin ester	None	No data
Heptane, branched, cyclic and linear	None	Irritant, Central nervous system
Tris(nonylphenyl) phosphite	None	No Target Organs

HAZARDOUS COMPONENT(S)	NTP CARCINOGEN	IARC CARCINOGEN	OSHA CARCINOGEN (SPECIFICALLY REGULATED)
Toluene	No	No	No
Modified rosin ester	No	No	No
Heptane, branched, cyclic and linear	No	No	No
Tris(nonylphenyl) phosphite	No	No	No

12. ECOLOGICAL INFORMATION

Ecological information	No specific studies have been conducted by Silvercote on the ecotoxicity or environmental fate of this material; however, commonly available data on the material indicate that uncontrolled releases to soil, ground water, or surface waters could entail acute and/or chronic ecological effects, depending on the quantity and concentration of such releases. Releases of volatile components to the atmosphere are not believed to entail significant ecological consequences provided such releases are within the exposure levels set forth in this document. Accordingly, all appropriate measures should be taken to avoid uncontrolled releases to the environment, and any spills or other uncontrolled releases which may occur should be contained and cleaned up immediately in accordance with Section 6.
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13. DISPOSAL CONSIDERATIONS

Information provided is for unused product only.

Recommended method of disposal: Legal disposition of wastes is the responsibility of the owner/generator of the waste. Applicable federal, state and/or local regulations must be followed during treatment, storage, or disposal of waste containing this product. Empty containers must be handled with care due to product residue.

14. TRANSPORT INFORMATION

The transport information provided in this section only applies to the material/formulation itself, and is not specific to any package/configuration.

U.S. Department of Transportation Ground (49 CFR)

Proper shipping name:	Adhesives
Hazard class or division:	3
Identification number:	UN 1133
Packing group:	II

International Air Transportation (ICAO/IATA)

Proper shipping name:	Adhesives
Hazard class or division:	3
Identification number:	UN 1133
Packing group:	II

Water Transportation (IMO/IMDG)

Proper shipping name:	ADHESIVES (Heptanes)
Hazard class or division:	3
Identification number:	UN 1133
Packing group:	II

15. REGULATORY INFORMATION

United States Regulatory Information:

TSCA 8 (b) Inventory Status:	All components are listed or are exempt from listing on the Toxic Substances Control Act Inventory.
TSCA 12 (b) Export Notification:	None above reporting de minimis.
CERCLA/SARA Section 302 EHS:	None above reporting de minimis.
CERCLA/SARA Section 311/312:	Fire, Immediate Health, Delayed Health
CERCLA/SARA Section 313:	This product contains the following toxic chemicals subject to the reporting requirements of section 313 of the Emergency Planning and Community Right-To-Know Act of 1986 (40 CFR 372). Toluene (CAS# 108-88-3).
CERCLA Reportable quantity:	Toluene (CAS# 108-88-3) 1,000 lbs. (454 kg)
California Proposition 65:	This product contains a chemical known in the State of California to cause cancer. This product contains a chemical known to the State of California to cause birth defects or other reproductive harm.

Canada Regulatory Information:

16. OTHER INFORMATION

This safety data sheet contains changes from the previous versions in sections: 2, 3, 8, 11, 15.

Prepared by: Product Safety and Regulatory Affairs
Issue date: 10/11/2017