



REFLECTIVE INSULATION
YOUR EVERYDAY INSULATION SOLUTION



INSTALL GUIDE

CLASS A PRODUCTS



ESP's Mission Statement

We the People of Environmentally Safe Products will continue to provide growth to our company, ensuring personal growth. This will be achieved by expanding our family worldwide, implementing new product ideas with customers needs in mind and constantly striving for perfection within our company.

The customers' needs will always be our focus. We have the philosophy that service is the key to success.

At ESP, Customer Service is not a department; it is an attitude!

Every person that is involved in this company will continue to follow this philosophy and pass it on to every new person that joins us.

One person alone can achieve great things. Many people united can achieve greatness. We will continue to work as a team from management to the entry-level position. We will continue to promote from within, allowing one to reach their personal goals. We will continue to prosper individually by helping the company to prosper. We will never lose the drive and motivation that made this company what it is today.

We take great pride in the sacrifices that we personally have made to create this company.

**We began by coming together,
We have progressed by staying together,
We shall succeed by working together!**

WE ARE Environmentally Safe Products!

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This manual is designed to assist you in understanding the R-values that can be achieved with the installation of ESP Low-E[®] Insulation.

A common misconception of reflective insulation is that one standard R-value is applicable for every application. The following system R-values you could achieve are based on test data obtained under controlled conditions and computer calculations or the ASHRAE Handbook of Fundamentals using FTC guidelines. The system R-values in this booklet were calculated using tested results from ASTM C-236 or ASTM C-976 test methods and calculations from the ASHRAE Handbook of Fundamentals, as well as computer calculations. To properly apply the data in this manual to your specific application we suggest you consult an engineer or architect.

While this information is presented in good faith and believed to be accurate, Environmentally Safe Products, Inc. and its distributors have no control over installation design, installation workmanship, accessories, materials or condition of application.

Environmentally Safe Products, Inc. does not guarantee results from reliance of such information and disclaims any liability from any loss or damage arising from its uses.

The reason we created ESP Low-E[®] Insulation

The primary function of ESP Low-E[®] insulation is to reduce the transfer of radiant energy. The materials that Low-E insulation is made from are polyethylene and aluminum. Our standard product consists of a micro-cell polyethylene core that will not absorb moisture, is very flexible and extremely strong and the foam core maintains its integrity when punctured by fasteners. The exterior surfaces are covered with polished aluminum. Our patented Low-E insulation does have tested "R" values but more importantly, it's aluminum surfaces have an emissivity of 0.03, which equates to 97% of radiant heat being stopped and reflected back to its source.

Most common or conventional insulations do their best to slow down the heat transfer, but no matter how thick they are, they have limited ability to reflect radiant energy. In fact, they can act like a battery, storing heat, then re-radiating it. Mass insulations can also store moisture which further reduces their capabilities to resist the transfer of thermal energy. For these reasons, by mid afternoon in the summer, buildings using only mass type insulation can become unbearably hot. Even large air conditioning units battle against the odds all day and put a serious drain on utility companies, not to mention your wallet.

By addressing only "R" values, manufacturers and consumers have ignored the major problem facing insulation today. You guessed it ... radiant heat transfer. By using Low-E, you can reflect the heat back to the source. Therefore, buildings become more temperature consistent and more economical to operate, no matter what the season.

Product Specific Install Instructions

An Air Space is Needed for Efficiency, Please Allow the Insulation to Sag in Your Roof System.

DO NOT PULL TIGHT!!

Wall Application:

This material is designed to be installed from top to bottom, eave strut to the ground or rake angle to the ground, (perpendicular to the girts).

1. Start at one end of the wall you are about to sheet.
2. Make sure the material is square with the wall.
3. Using C-Clamps and a block of wood, secure the material to either the rake angle or eave strut.
4. Place double-sided adhesive tape around entire bottom perimeter of the building on the outside of the metal plate. Steadily, unroll the material to the ground, adjust roll so seams line up evenly then secure the bottom of the roll to the double-sided adhesive tape.
5. Go back to the top of the wall.

If Product has the Staple Flange Edge:

7. Bring the core edges tightly together with both flanges (no core in them) towards you.
8. Roll both flanges together securely keeping core edges tightly together.
9. Staple the flanges close to the core with a heavy-duty plier stapler every 2-3 inches.
10. Then put closure strips over insulation and cut off excess.
11. Be sure to leave enough overlap to ensure that the material will not pull apart after panels are installed.
12. Repeat Steps 5 thru 11 until you complete the the area to be insulated.



1. Peel paper from strip.



2. Fold back both tabs.



3. Stick adhesive side to non adhesive side.



4. Staple (Staple every 12" for best results)



If Product has the EZ-Seal Edge:

7. Fold back the insulated tab on the leading edge of the run you just finished.
8. Fold back the insulated tab on the trailing edge of the run you are about to install. It will contain double-sided adhesive tape.
9. Butt the folded edge of the new run tightly against the folded edge of the run which is already in place.
10. Repeat steps 2 and 3.
11. Peel off the release paper from the double-sided adhesive tape.

IF THE TAPE ISN'T STICKING BECAUSE OF MOISTURE IN THE AIR STAPLE EVERY 2-3 INCHES AND DON'T USE THE TAPE TAB TO SEAL THE EDGE.

12. Press the two insulated tabs tightly together making certain they are even. Place your thumb and fingers in the groove and use as a guide as you work down the wall. NOTE: For best appearance and easiest installation it is advisable to complete the process in steps 10 & 11 a foot or so at a time as you unroll down the wall.
13. Using a heavy-duty plier stapler, staple taped seam every 6 - 12 inches.
14. Steadily unroll the run down the wall, about a foot or so at a time, continue using the process described in steps 10 and 11.

If Product has Trimmed Edge:

7. Butt the edges of the insulation together.
8. Starting at one end of the edges, pull the paper backing off of the tape to apply the seam tape.
9. While applying the seam tape use the plastic squeegee (provided for you) to bond the insulation and the seam tape together. This is done by taking the plastic squeegee and firmly pressing down, running it the length of the tape. If done correctly, you will see that the seam tape blends in with the insulation. (If the squeegee is not used, the seam tape will not adhere itself to the insulation and the seams will possibly come loose over time.)
10. Apply small sections at a time, making sure that you are bonding the seam tape to the insulation.
11. Once you reach the end of your length, use a razor knife or a pair of scissors to cut the seam tape. Tearing the tape may stretch it and the adhesive; this puts an undue strain on the tape and will hamper its performance.
12. Place closure strips over the insulation.
13. Repeat steps 5 thru 11 until you complete the area to be insulated.

Install Instructions Continued

Installation Instructions Cont.

Roof Application: Start by using a double-sided adhesive tape around the roof perimeter or fold a small section of the material back over and secure to the eave with a fastener every 6-12 inches. *It is important to have an airspace between the roof decking and the Low-E. This is achieved by draping the Low-E, allowing it to sag approx. 3/4 "-1"*

NOTE: If any defective or damaged material is encountered simply cut out the bad section and splice the remaining material together.

All splices made on wall sections must be placed behind the girts. This will conceal the splices and help to maintain a completely uniform appearance.

To do this, go to the girts immediately above and below the defective or damaged material and cut out from these lines. This will allow you to make your splice behind the girt.

Seams that are exposed to conditioned space must be taped with Low-E Seam tape. This product should not be left exposed in a ceiling that is 10' high or less. Consult your local building/fire codes to ensure that the proper material is used if this situation does occur. This product should not be overlapped. Never interfere with the design ventilation of the building when installing any form of insulation. Never expose any insulation to any fire source. Insulation should be stored in a protected area. Do not let insulation come in contact with wet or damp concrete at any time. Any tears or punctures in the insulation should be repaired by the appropriate Low-E Seam tape.

Splicing Low-E insulation:

Place double sided tape on last purlin covered by Low-E insulation to secure end. Trim end where it is concealed by purlin. Place double sided tape on the top of the Low-E insulation and lay new section on the top of the existing one. Procedure for making a splice: 1. Cut a piece from another roll a little larger than the area to be removed. Overlay the ends of the two pieces to be spliced together. 2. Cut through the two pieces using a straight edge, to create a common edge. 3. Butt the two edges tight together. 4. Tape the seam on both sides using the manufacturer provided aluminum seam tape. **WHEN APPLYING LOW-E SEAM TAPE BE SURE TO CUT THE TAPE. DO NOT RIP OR TEAR. RIPPING OR TEARING CAN NEGATIVELY AFFECT THE ADHESIVE. WHEN APPLYING LOW-E SEAM TAPE, BE SURE TO USE THE MANUFACTURER SUPPLIED SQUEEGEE TO ENSURE THE TAPE IS PROPERLY ADHERED. WHEN USING TAPE TO MAKE REPAIRS RUN TAPE PARALLEL WITH THE INSULATION. ***NEVER RUN TAPE AT AN ANGLE.** NOTE: Low-E seam tape can also be used as a patch material to cover up and repair any cracks or tears in the LOW-E. Please refer to the above instructions for the application of LOW-E seam tape. NOTE: When installing above a framed opening i.e. (a dock door) be sure to wrap the material around the door header to the inside of the building. The door installers can then trim any excess LOW-E out of the way. This procedure will ensure that there will not be a gap in the insulation after the door is installed.

NOTE: If any defective or damaged material is encountered, simply cut out the bad section and splice the remaining material together. Local building codes shall be followed to ensure proper installation. The thermal performance of Low-E Insulation in these installations are based on the maintenance of a totally enclosed air space adjacent to the low emittance surface(s). Thermal values for this product are defined by typical installations and are obtained in accordance to accepted test methods and are subject to manufacturing variations. They are supplied as a technical service and are subject to change without notice. These products should never have a core edge exposed. Seams that are exposed to conditioned space must be taped with Low-E Seam tape. No insulation products should be left exposed in a ceiling that is 10' high or less. Add Gypsum board or another type of fire wall. Consult your local building/fire codes to ensure that the proper material is used if this situation does occur. These products should not be overlapped. Never interfere with the design ventilation of the building when installing any form of insulation. Never expose any insulation to any fire source. Insulation shall be stored in a protected area. Do not let insulation come in contact with wet or damp concrete at any time.

****IT IS EXTREMELY IMPORTANT TO LINE THE SEAMS UP STRAIGHT IN ALL APPLICATIONS BEFORE YOU SECURE THE INSULATION. PLEASE DO NOT WALK ON INSULATION WHEN IT IS CUT BEFORE INSTALLATION.**

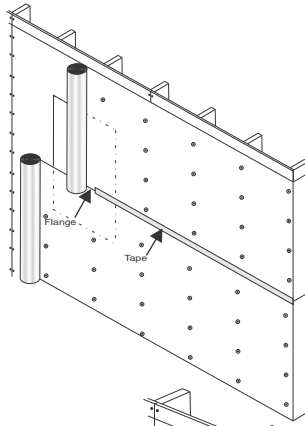
These products should never have a core edge exposed. Seams that are exposed to conditioned space must be taped with Low-E Seam tape.

HouseWrap Applications

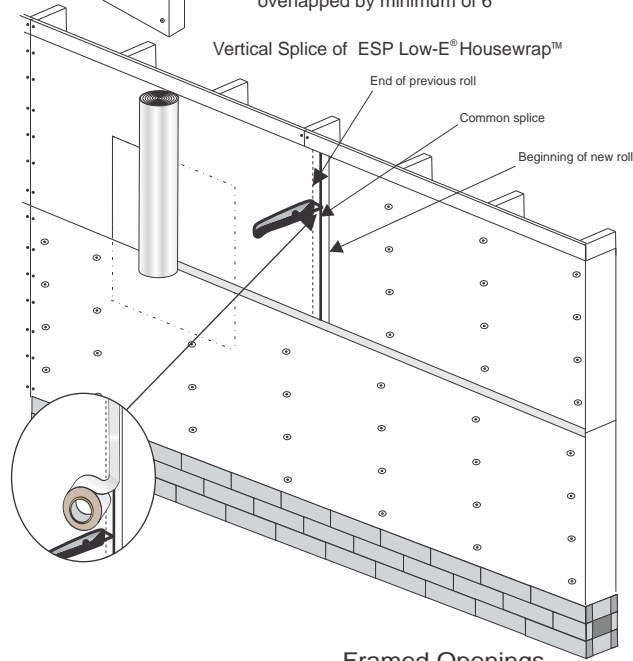
System R-Value: R-4.17 Horizontal Heat Flow Only

Installation Method (Existing Walls)

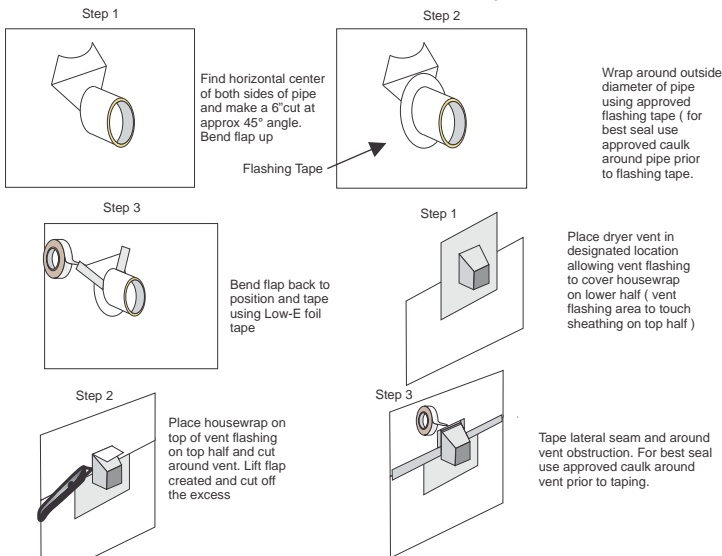
1. ESP Low-E® Housewrap is installed over exterior wall sheathing, make sure reflective side faces out: foil flange faces down.
2. Determine width of ESP Low-E® HouseWrap being used (4', 5', 6') for initial wrap (lowest point of wall surface)
3. Measure from sill plate up the wall, mark wall at level of determined width less 1" i.e. 5' ESP Low-E® HouseWrap mark at 59"
4. Snap chalkline around perimeter
5. Starting at the corner of the preferred exterior wall unroll ESP Low-E® Housewrap in a horizontal manner. Fasten using corrosion resistant staples having minimum 1" wide crown, corrosion resistant nails having minimum 3/8" heads or corrosion resistant nails having minimum 1" diameter plastic heads. Fasteners to be spaced a maximum of 16" both vertically and horizontally.
6. When rolling ESP Low-E® Housewrap over door and window openings: If windows and doors have been set, trim ESP Low-E® HouseWrap as close to window or door opening as possible and perform detailing as per door / window manufacturer and or code standards.
7. The bottom side of the ESP Low-E® Housewrap should extend over sill plate by minimum 1".
8. When applying second horizontal run of ESP Low-E® Housewrap butt foam ends together allowing foil flange to overlap 2". Make certain foil flange is to the outside to ensure water drainage plane downward.
9. Tape all vertical and horizontal flange seam areas with foil tape.
10. Continue method until ESP Low-E® Housewrap covers both top plates.
11. Use foil tape to repair areas that have been torn or compromised. (See page 7)
12. **Foil is a conductor of electricity. Use extreme caution when working with ESP Low-E® Housewrap around power lines, wiring and electrical devices.**



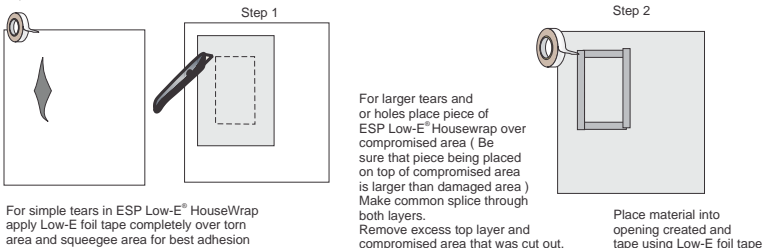
1. When coming to the end of existing roll in use, leave up to 12 inches of product unattached to wall system.
2. Remove new roll from packaging
3. Unroll ESP Low-E® Housewrap to desired area making sure that product is plumb and square with housewrap already in place and also overlap material past the end of previous material by approx 8 inches.
4. Locate center of overlapped materials and make common splice through both layers of material using utility knife.
5. Remove cut material from end of previous roll and start of new roll
6. Apply Low-E Tape over common splice, then continue installing ESP Low-E® Housewrap as described in Figure 1
7. If vertical splice is not performed, product must be overlapped by minimum of 6"



Penetration Installation Diagrams



Tears and Holes Repair



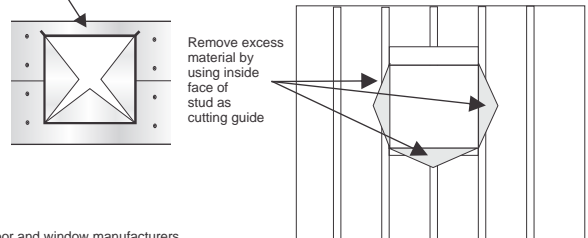
Framed Openings

When installing ESP Low-E® Housewrap over the exterior of structure be sure to run product horizontally over entire wall including framed openings. (please refer to page 5 for more detailed instructions)

Once ESP Low-E® Housewrap has been securely fastened to exterior sheathing make cuts as shown in Figure 2. Try not to cut past exterior side of framed opening (exception for top of framed opening) but in the event that occurs use Low-E foil tape to repair area that was compromised.

1. An additional flap should be cut above the top exterior side of framed opening for the installation of head flashing.
2. Bend flap away from wall to allow installation of window and flashing
3. Apply window and head flashing
4. Reset ESP Low-E® Housewrap and tape seams

Once side and bottom flaps have been cut, bend these flaps toward the interior of structure using staples or adhesive to attach ESP Low-E® Housewrap to the face of the jamb.



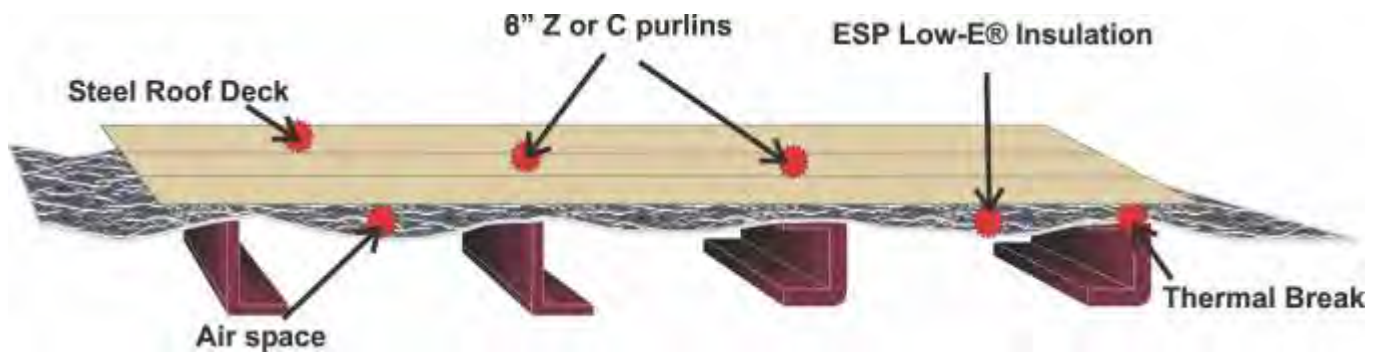
Follow door and window manufacturers instructions for flashing and installation relating to their respective products.

SYSTEM R-VALUE CALCULATIONS FOR THIS ASSEMBLY WERE PERFORMED BY R & D SERVICES REPORT # RD03224

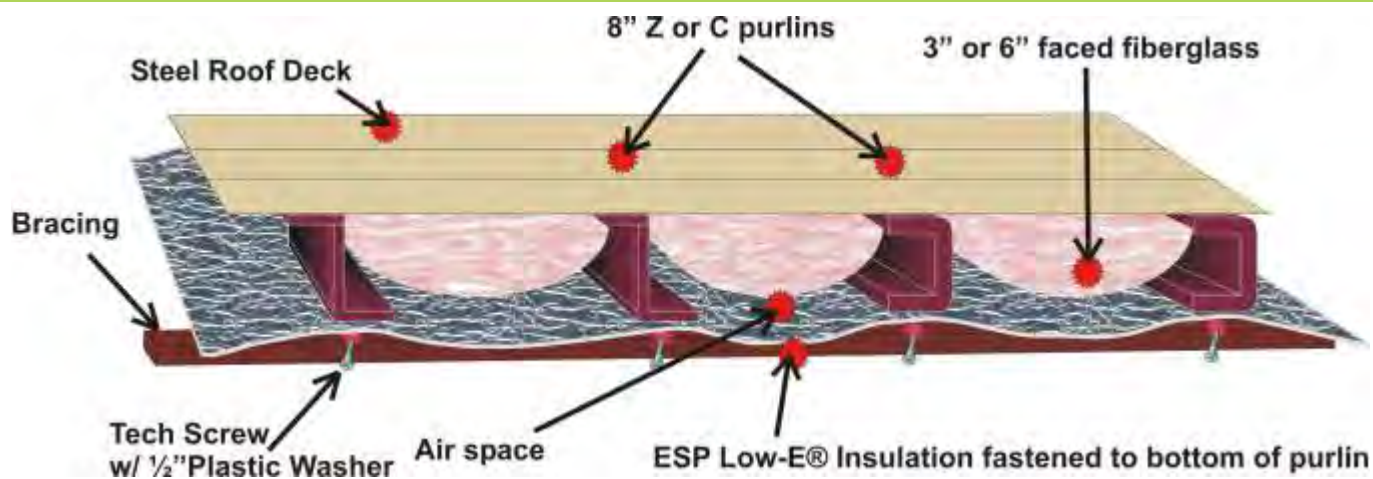
Pre Engineered Steel Applications

Commercial Metal Roofing

Average System R-Value: Down R- 11.04, Up R- 7.39



Average System R-Value: Down R- 21.04 (3" Fiberglass), Down R- 30.04 (6" Fiberglass)
Up R- 17.38 (3" Fiberglass), Up R- 26.39 (6" Fiberglass)

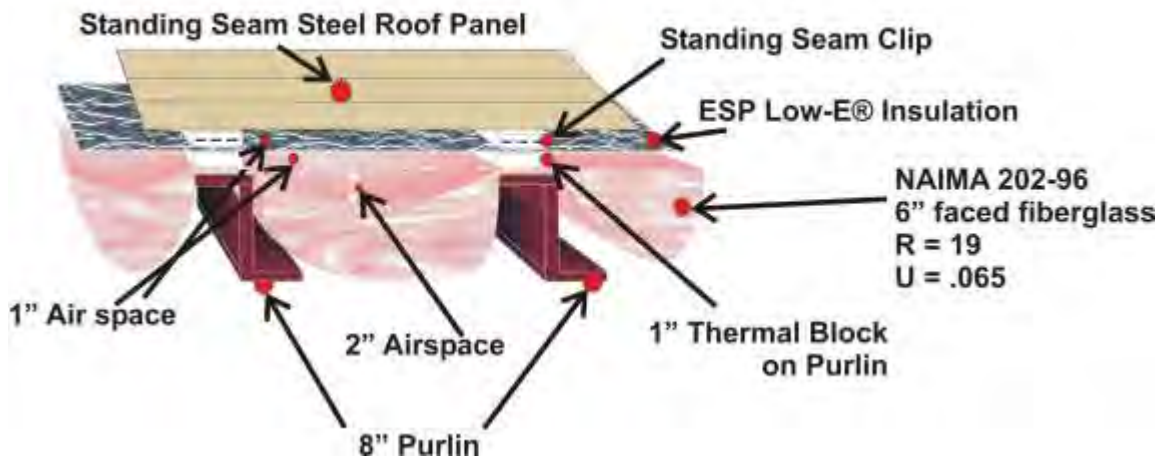


SYSTEM R-VALUES FOR ESP LOW-E® INSULATION AS PER ASTM C-976, AIR TO AIR, ADJUSTED TO MEET CRITERIA EQUIVALENT TO ASTM 1224

ASHRAE 90.1 Compliance Application

Average System R-Value: R- 17.85 (3" Fiberglass) *SDR, R- 21.73 (3" Fiberglass) *SSR, R- 18.51 (4" Fiberglass) *SDR
R- 26.31 (6" Fiberglass) *SDR, R- 30.30 (6" + 3" Fiberglass) *SSR, *SDR = Screw Down Roof *SSR = Standing Seam Roof

ESP Low-E® Insulation and ASHRAE 90.1 System Patent Pending



SYSTEM R-VALUES CALCULATED USING ENVSTD 4.0 ESP LOW-E® INSULATION AS R-11 SHEATHING

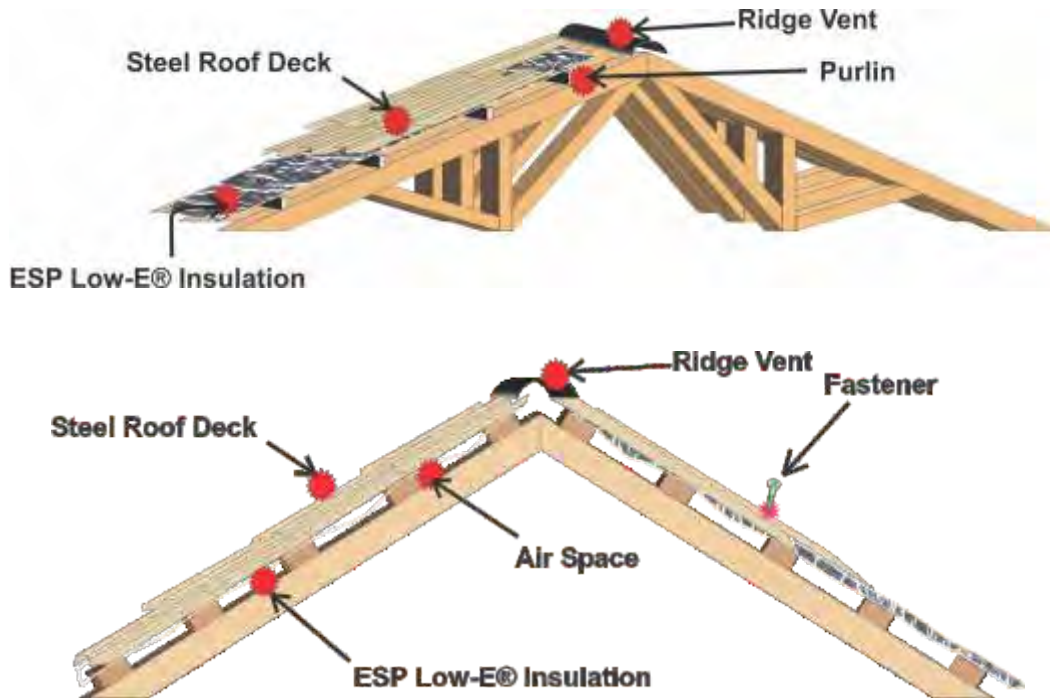
Post Frame Applications

Post Frame Roof Application

Average System R-Value: Down R- 11.04, Up R- 7.39

When installing Low-E Insulation in post frame buildings, it is important to have an air space between the metal roof panel and the Low-E. This is best achieved by draping Low-E over the purlins from eave to eave, allowing it to sag approximately 3/4" to 1" between the purlins. After the first 4' run is tack fastened (3 1/2" staples /purlin), install the first section of roof sheeting and work from that to make the next run of Low-E and so on for the length of the building. It is important that all seams be securely taped with Low-E tape unless a staple flanged product is used.

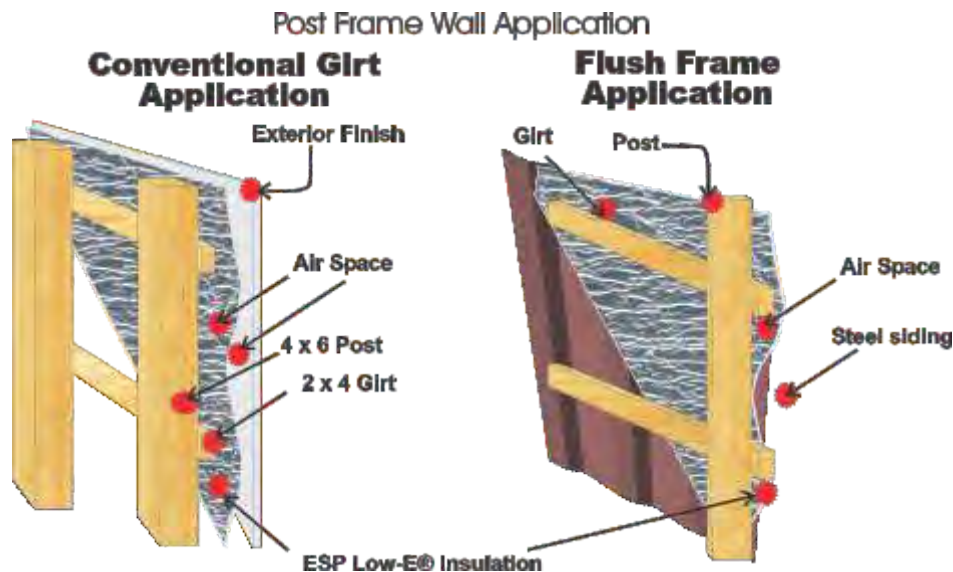
If the building has a ridge vent, cut the Low-E loose at the peak before installing the vent.



Post Frame Wall Application

Average System R-Value: Horizontal R- 8.55

Wrap Low-E Insulation around outside of framework, temporarily tack fasten Low-E loosely to outside of each girt with 1/2" staples allowing Low-E to bow in approximately 3/4" creating an enclosed air space. To achieve a vapor barrier all adjoining seams must be securely taped using Low-E tape unless a staple flanged product is used. Then attach metal siding by approved method.

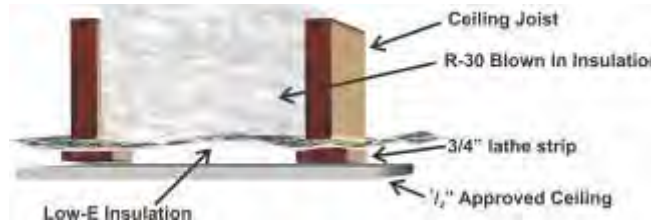


Ceiling Applications

Ceiling Application with Low-E & Blown In Insulation

System R-Value: R- 34.70 Downward Heat Flow, System R-Value R- 33.75 Upward Heat Flow

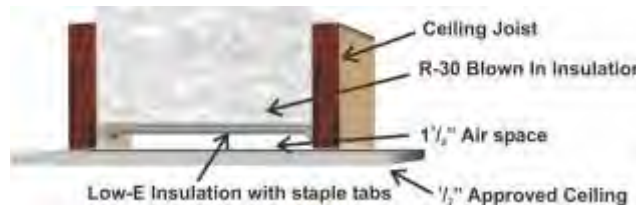
Measure entire ceiling joist area to determine square footage of Low-E Insulation required (length x width). Roll out material and fasten to bottom of ceiling joist, stapling with 1/2" staples every 6". To achieve a vapor barrier, all adjoining seams must be taped securely with Low-E tape. Secure lathe strips and interior ceiling using approved application methods.



Recessed Ceiling Application with Low-E & Blown In Insulation

System R-Value: R- 38.04 Downward Heat Flow, System R-Value R- 32.87 Upward Heat Flow

Measure entire ceiling joist area to determine square footage of Low-E Insulation required (length x width). We recommend using Low-E Insulation with tabs. Roll out tab material and fasten by recessing it 1-1/2" into ceiling joist cavity, stapling with 1/2" staples every 6". To achieve a vapor barrier, all adjoining seams must be taped securely with Low-E tape. Secure interior ceiling using approved application methods.



SYSTEM R-VALUES FOR THESE INSTALLATION METHODS WERE CALCULATED USING DATA FROM THE 1989 ASHRAE HANDBOOK OF FUNDAMENTALS

Suggested Cathedral Ceiling Installation

System R-Value: R- 29.74 Downward Heat Flow, R- 23.55 Upward Heat Flow

Install 24" ESP Low-E® Tab Insulation as the baffling under wood deck to insure proper ventilation. Install fiberglass according to manufacturers recommendation.

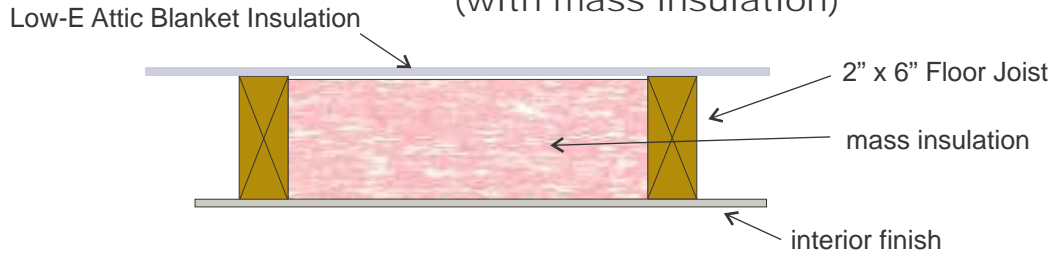


SYSTEM R-VALUES FOR ESP LOW-E® INSULATION AS PER ASTM C-976, AIR TO AIR, ADJUSTED TO MEET CRITERIA EQUIVALENT TO ASTM 1224

Attic Applications

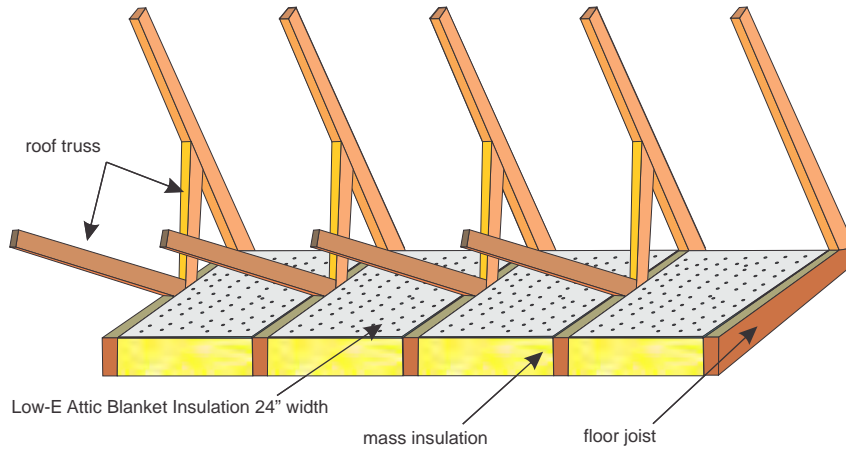
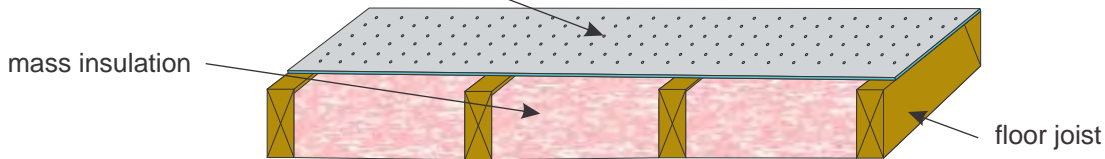
Attic Floor / Attic Blanket

Low-E Attic Blanket Floor Application (with mass insulation)



Low-E Attic Blanket can be rolled out over existing mass insulation. The product is perforated and will not trap moisture. Low-E Attic Blanket can be stapled with 1/2" staples every 6". Since it is not a vapor barrier, taping of seams is optional.

Low-E Attic Blanket Insulation 4' width

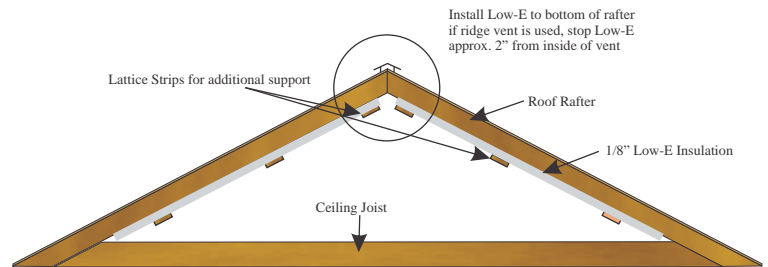
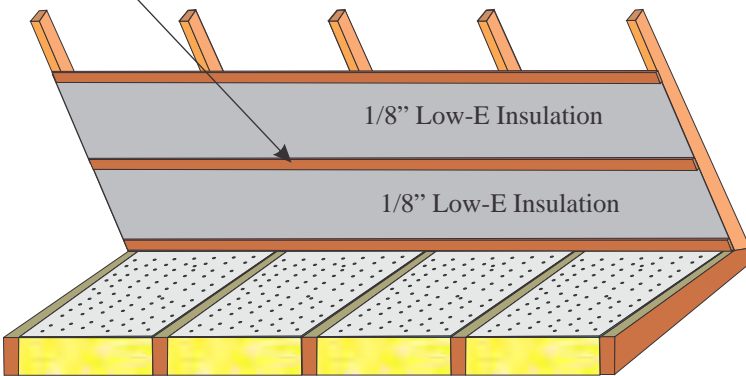


Attic Rafters / 1/8" Low-E Insulation

Low-E Roof Rafter Installation

*Do Not Use Attic Blanket In Rafter Applications

Lattice Strips
for additional support



Note: If pre-manufactured truss assembly is used, retro fit between trusses with Low-E 16" / 24" Tab Material to avoid bracing cuts.
*****NEVER BLOCK SOFFIT OR GABLE VENTS!

This installation below is for retrofitting rafters as an energy upgrade. Low-E Insulation is installed across the bottom face of the rafter. Proper ventilation must be maintained. Measure rafter area to determine square footage of Low-E Insulation required (length x width). Roll out material and fasten to bottom of rafter face with 1/2" staples approximately every 6 inches. We suggest starting at the peak and working down to the eave. Leave approximately 1/2" space at the peak for ventilation. All adjoining seams must be taped securely with Low-E tape, unless a staple flange product is used. To prevent insulation from falling from rafters, ESP Low-E recommends using lattice strips for added support.

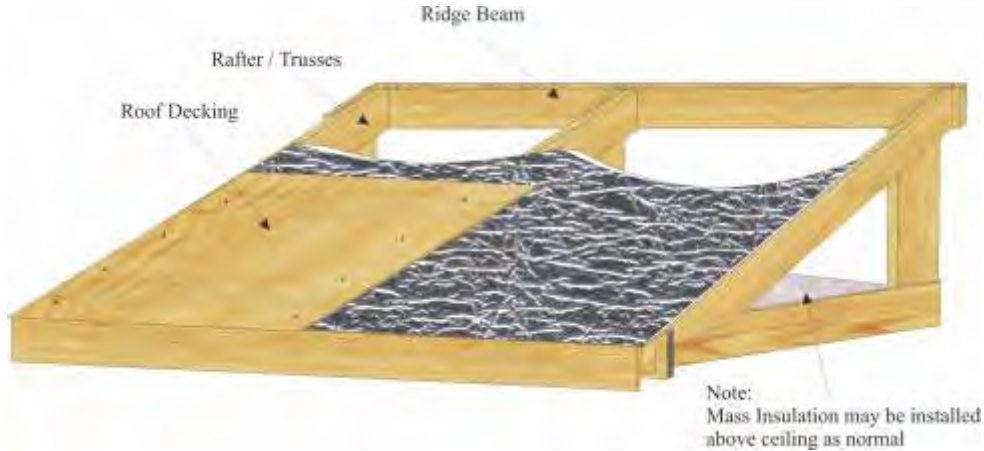
Note: Drawings are not to scale and are meant to depict possible applications. Exact Specifications may vary. See Attic Blanket Install Guide for further instructions.

Roofing Applications

New Construction Over Roof Rafter Installation

System R-Value: R- 11.04 Down, R- 7.29 Up

After roof truss or roof rafters have been located and installed, install Low-E Insulation® by drooping approx. 2" at center of span over the truss/rafters. Use staples to attach material. To assure a proper vapor barrier, all seams should be taped securely with Low-E tape. If continuous roof/ridge vent is to be installed, insulation should stop approx. 2" from vent to allow flow of air out of roof system.

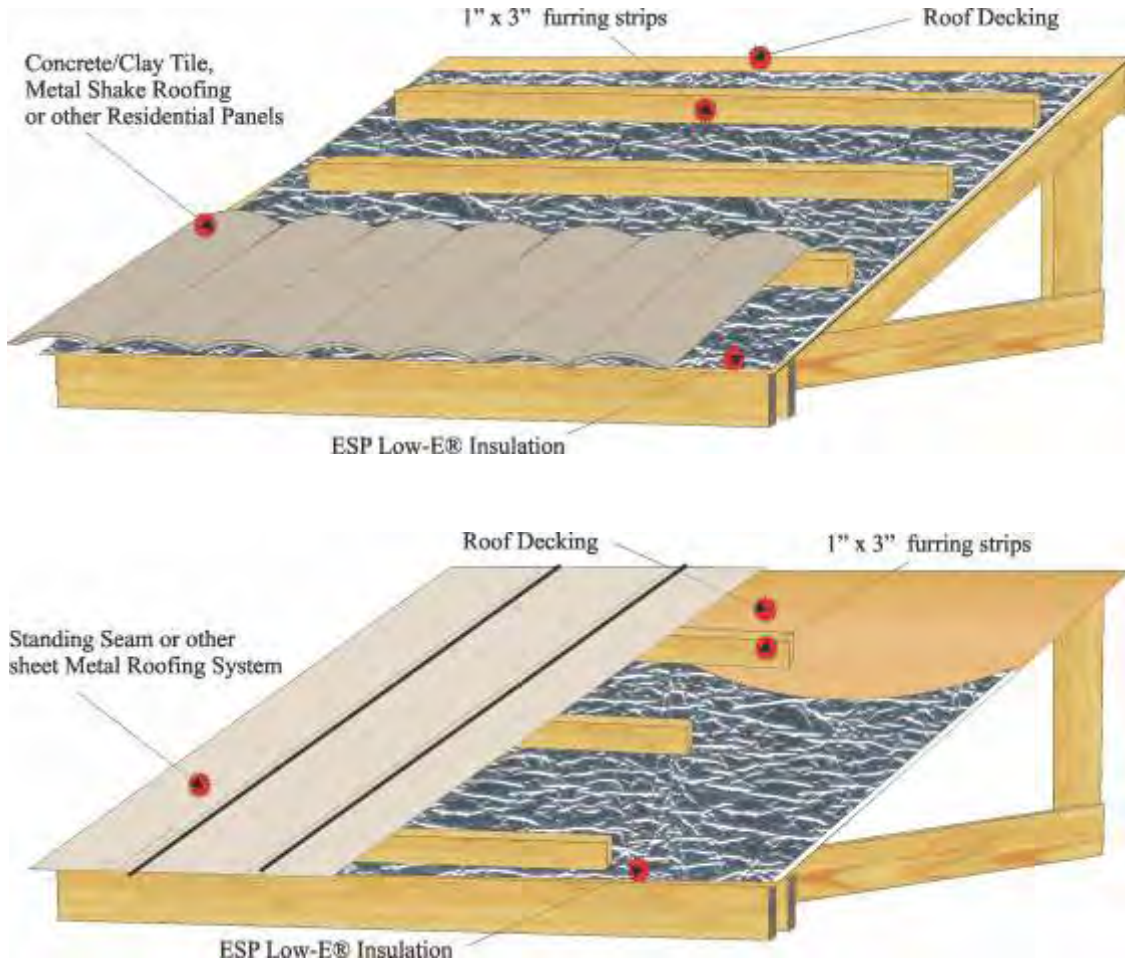


SYSTEM R-VALUES FOR THESE INSTALLATION METHODS WERE CALCULATED USING DATA FROM THE 1989 ASHRAE HANDBOOK OF FUNDAMENTALS

Residential Metal Roof Installation

Average System R-Value: R- 9.15 Down

Furring boards provide airspace between top of ESP Low-E® Insulation and underside of metal roof.



SYSTEM R-VALUES FOR THESE INSTALLATION METHODS WERE CALCULATED USING DATA FROM THE 1989 ASHRAE HANDBOOK OF FUNDAMENTALS

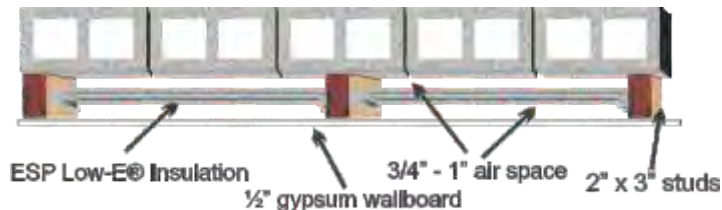
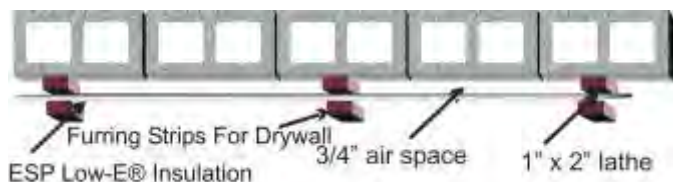
Basement/Block Wall - Crawl Space - Floor Joist Applications

Basement Wall Application

¹ System R-Value: R- 5.7 Horizontal Heat Flow Only

System R-Value: R- 8.12 Horizontal Heat Flow Only

Please note that these are two different applications with different R-values. Measure wall area to determine square footage of Low-E Insulation required (length x height). Roll out material and fasten as per diagram with 1/2" staples approximately every 6". To achieve a vapor barrier, all seams and stud faces must be taped securely with Low-E tape.



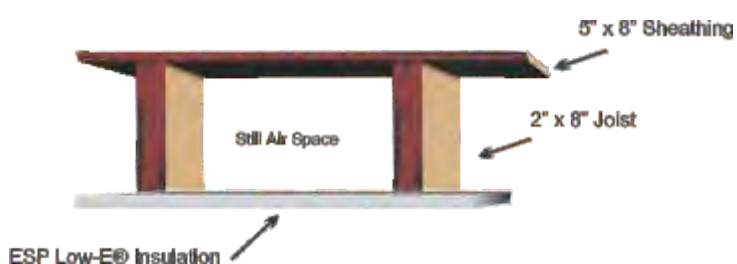
¹ SYSTEM R-VALUES FOR HORIZONTAL HEAT FLOW, WITH ONE ENCLOSED AIR SPACE, INCLUDES AN ADDITIONAL 1.70 STILL AIR FILM FOR EXPOSED SIDE OF ESP LOW-E®

Crawl Space Application

² System R-Value: R- 20 Downward Heat Flow Only

ESP Low-E® can be used under your floor in a crawlspace to stop any air infiltration and add high insulating value to your floors. In a crawlspace application ESP Low-E® can achieve as high as an R-20. ESP Low-E® will not mold, mildew or absorb moisture, so once it's installed there is virtually no maintenance involved. In areas where flooding is a problem ESP Low-E® will eliminate the concern of your insulation system performing below average.

This Installation is for basement / crawlspaces with a 2" x 8" joist minimum. ESP Low-E® Insulation is installed across the bottom face of the joist. ALL R-VALUES ARE SYSTEM R-VALUES. AN ENCLOSED AIR SPACE MUST BE MAINTAINED TO ACHIEVE THESE VALUES. IF THE BOTTOM SURFACE OF THE LOW-E INSULATION MUST BE COVERED BY ANOTHER SURFACE, R-VALUE MAY BE LOWER.



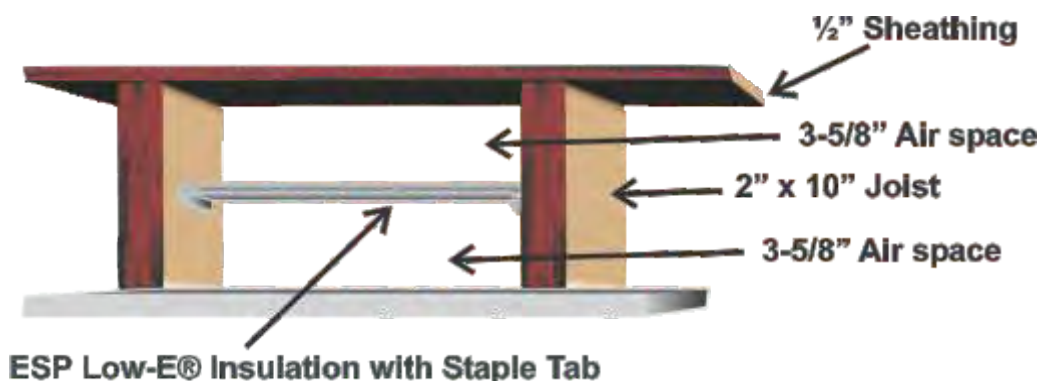
Measure entire joist area to determine square footage of ESP Low-E® Insulation required (length x width). Roll out material and fasten to bottom of floor joist with 1/2" staples every 6". To achieve a vapor barrier, all seams must be taped securely with Low-E tape.

² SYSTEM R-VALUES FOR HEAT FLOW DOWN, WITH ONE ENCLOSED AIR SPACE, INCLUDES AN ADDITIONAL 4.55 STILL AIR FILM FOR EXPOSED SIDE OF ESP LOW-E®

Floor Joist Application

System R-Value: R- 20.20, Downward Heat Flow Only

Measure entire joist area to determine square footage of ESP Low-E® Insulation required (length x width). We recommend ESP Low-E® 16" or 24" tab material. Roll out material and fasten to inside of floor joist in the center of the cavity by stapling 3/4" tabs as per diagram to right with 1/2" staple every 6". To achieve a vapor barrier, all seams must be taped securely with Low-E tape.



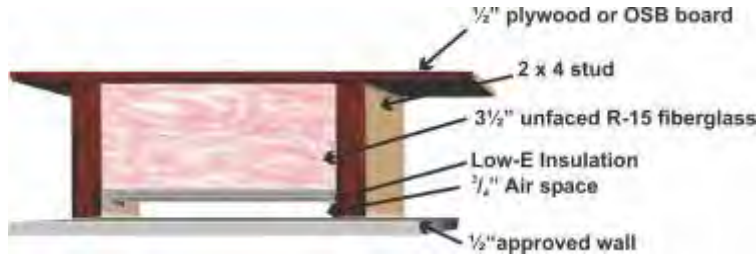
SYSTEM R-VALUES FOR THESE INSTALLATION METHODS WERE CALCULATED USING DATA FROM THE 1989 ASHRAE HANDBOOK OF FUNDAMENTALS

Wall Applications

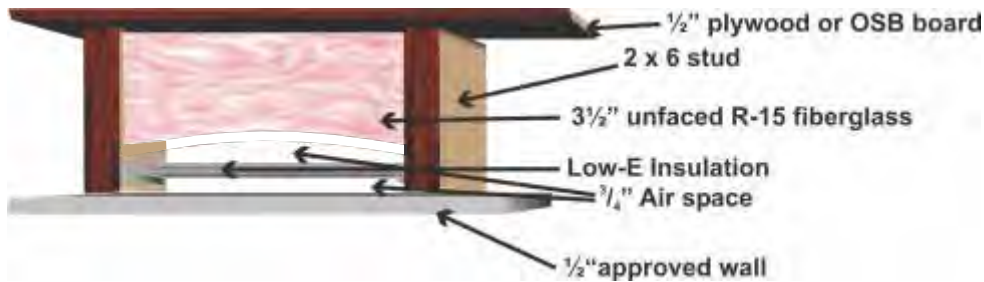
Wall Application with Low-E & Mass Insulation (2X4) & (2X6)

System R-Value: R- 18.91, Horizontal Heat Flow Only

The first step in this application is to install mass insulation in the wall cavity. Next, install Low-E Insulation Tab Material with the tab flush to the outside of the stud. It is recommended that 1/2" staples be applied approximately every 6" along tab to fasten Low-E. All seams should be taped securely with Low-E Tape. Cover the face of each stud with tape and all seams around electrical boxes should be taped.



System R-Value: R- 22.75, Horizontal Heat Flow Only

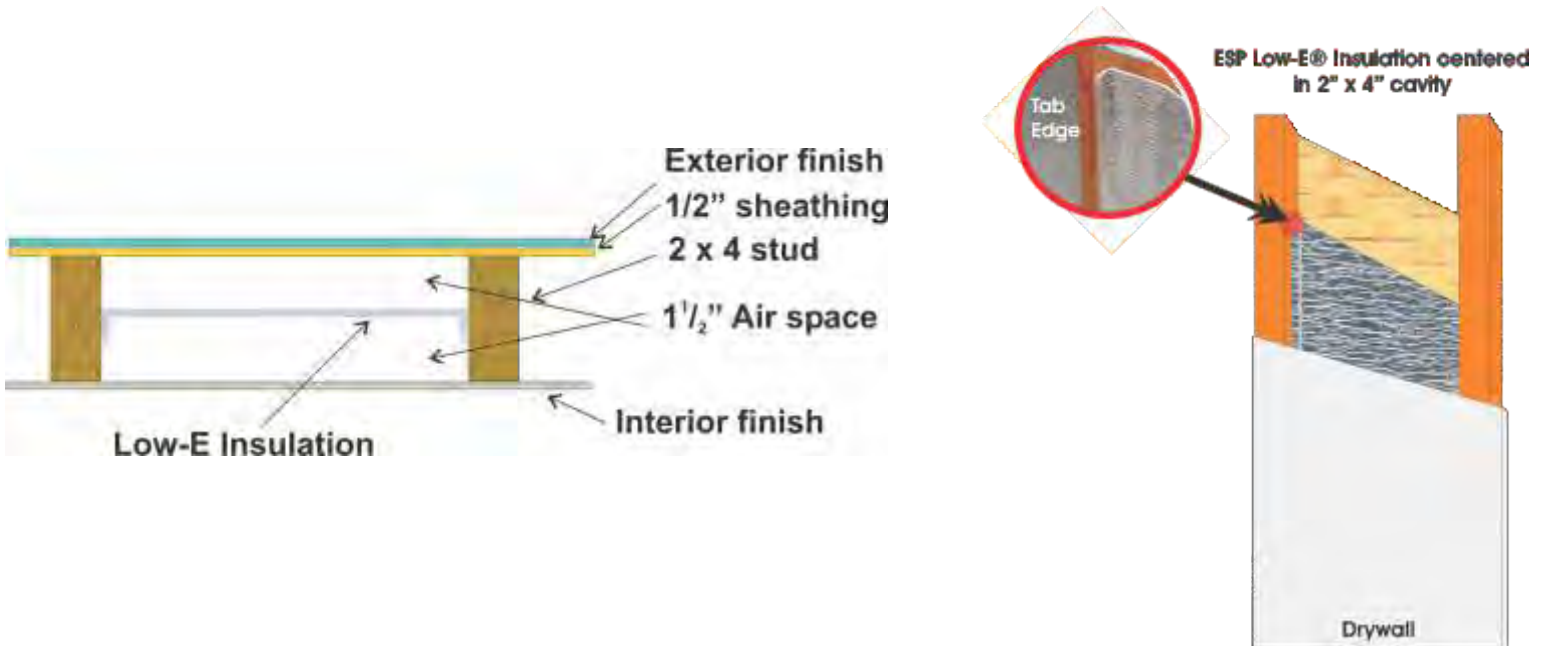


SYSTEM R-VALUES FOR THESE INSTALLATION METHODS WERE CALCULATED USING DATA FROM THE 1989 ASHRAE HANDBOOK OF FUNDAMENTALS

Wall Application with 1 Layer Low-E Insulation (No Mass Insulation)

System R-Value: R- 9.06, Horizontal Heat Flow Only

Install Low-E Insulation Tab Material with the tab centered within the stud cavity. It is recommended that 1/2" staples be applied approximately every 6" along tab to fasten Low-E. All seams are taped securely with Low-E Tape. All seams around electrical boxes are taped. To achieve a vapor barrier, all seams must be taped securely with Low-E tape.



CALCULATIONS FOR THIS ASSEMBLY WERE PERFORMED BY R & D SERVICES REPORT # RD03224



ESP LOW-E[®] INSULATION

PRODUCT CODES*: 4LFLT, 6LFLT(trimmed), 4LFLS, 6LFLS(staple flange), 4LMLT (4' only)

PRODUCT DIMENSIONS & DESCRIPTION*

Double sided scrimmed aluminum foil laminated to 1/4" or 1/8" (nominal thickness) polyethylene foam.

Edges can be trimmed or with staple flange

WIDTH**: 4', 6' respectively

LENGTH**: 125' (stock size 4'width) 84' (stock size 6' width)

R-Value***: R-11 down R-8 up R-7 horizontal

PERM RATING: ASTM E-96 0.008

FLAME AND SMOKE: ASTM E-84 Flame spread <25 Smoke developed <50

FULL SCALE FIRE TEST: NFPA-286 Passed

EMITTANCE: ASTM C-1371 0.03

* This label refers to the ESP Low-E[®] line of insulation products supplied by ESP, Inc. and includes information on different widths and attachment features of the ESP Low-E[®] line. For information on specific product purchased refer to thermal label affixed to the roll of insulation

** Additional widths and lengths are available upon request and approval by ESP, Inc.

*** R-value results are obtained from ASTM C976. R-values for ESP Low-E[®] materials can be higher or lower depending upon application. Specific R-values for specific applications can be obtained from installation manual at www.low-e.com or by contacting ESP, Inc. at 1-800-289-5693

"R means resistance to heat flow. The higher the R-value, the greater the insulating power." "To get the marked R-Value, it is essential that this insulation be installed properly. If you do it yourself, get instructions and follow them carefully. Instructions do not come with this package." To obtain installation instructions visit www.low-e.com or call 1-800-289-5693

CAUTION: Do not allow product to become damp or wet while rolled in sealed bag
Do not set product directly on wet or uncured concrete

WARNING: Aluminum is an electrical conductor. Please use caution when working around electrical sources including overhead power lines. Carefully inspect electrical junction boxes and check for frayed wires before beginning installation

Note: ESP Low-E[®] is a versatile product for many applications and industries.



Environmentally Safe Products, Inc.
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ESP LOW-E[®]: ECONO-E[®] INSULATION

PRODUCT CODES*: 4EFET, 6EFET(trimmed), 4EFES, 6EFES(staple flange), 4EFEZ, 6EFEZ(ez seal)

PRODUCT DIMENSIONS & DESCRIPTION*

Double sided scrimless aluminum foil laminated to 3/16" (nominal thickness) polyethylene foam. Edges can be trimmed, with staple flange or with EZ-Seal self taped flange feature.

WIDTH**: 4', 6' respectively

LENGTH**: 125' (stock size 4'width) 84' (stock size 6' width)

R-Value***: R-11 down R-8 up R-7 horizontal

PERM RATING: ASTM E-96 0.008

FLAME AND SMOKE: ASTM E-84 Flame spread <25 Smoke developed <50

FULL SCALE FIRE TEST: NFPA-286 Passed

EMITTANCE: 0.03

* This label refers to the Econo-E[®] line of insulation products supplied by ESP, Inc. and includes information on different widths and attachment features of the Econo-E[®] line. For information on specific product purchased refer to thermal label affixed to the roll of insulation

** Additional widths and lengths are available upon request and approval by ESP, Inc.

*** R-value results are obtained from ASTM C976. R-values for Econo-E[®] materials can be higher or lower depending upon application. Specific R-values for specific applications can be obtained from installation manual at www.low-e.com or by contacting ESP, Inc. at 1-800-289-5693

"R means resistance to heat flow. The higher the R-value, the greater the insulating power." "To get the marked R-Value, it is essential that this insulation be installed properly. If you do it yourself, get instructions and follow them carefully. Instructions do not come with this package." To obtain installation instructions visit www.low-e.com or call 1-800-289-5693

CAUTION: Do not allow product to become damp or wet while rolled in sealed bag
Do not set product directly on wet or uncured concrete

WARNING: Aluminum is an electrical conductor. Please use caution when working around electrical sources including overhead power lines. Carefully inspect electrical junction boxes and check for frayed wires before beginning installation

Note: ESP Econo-E[®] is a versatile product for many applications and industries.



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ESP LOW-E®: MICRO-E® INSULATION

PRODUCT CODES*: 4EMET (trimmed), 4EMES (staple flange)

PRODUCT DIMENSIONS & DESCRIPTION*

Double sided scrimless aluminum foil laminated to 1/8" (nominal thickness) polyethylene foam. Edges can be trimmed or with staple flange.

WIDTH**: 4'

LENGTH**: 125' (stock size 4'width)

R-Value***: R-10 down R-7 up R-6 horizontal

PERM RATING: ASTM E-96 0.008

FLAME AND SMOKE: ASTM E-84 Flame spread <25 Smoke developed <50

EMITTANCE: ASTM C-1371 0.03

* This label refers to the Micro-E® line of insulation products supplied by ESP, Inc. and includes information on different widths and attachment features of the Micro-E® line. For information on specific product purchased refer to thermal label affixed to the roll of insulation

** Additional widths and lengths are available upon request and approval by ESP, Inc.

*** R-value results are obtained from ASTM C976. R-values for Micro-E® materials can be higher or lower depending upon application. Specific R-values for specific applications can be obtained from installation manual at www.low-e.com or by contacting ESP, Inc. at 1-800-289-5693

"R means resistance to heat flow. The higher the R-value, the greater the insulating power." "To get the marked R-Value, it is essential that this insulation be installed properly. If you do it yourself, get instructions and follow them carefully. Instructions do not come with this package." To obtain installation instructions visit www.low-e.com or call 1-800-289-5693

CAUTION: Do not allow product to become damp or wet while rolled in sealed bag
Do not set product directly on wet or uncured concrete

WARNING: Aluminum is an electrical conductor. Please use caution when working around electrical sources including overhead power lines. Carefully inspect electrical junction boxes and check for frayed wires before beginning installation

Note: ESP Micro-E® is a versatile product for many applications and industries.



Environmentally Safe Products, Inc.

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ESP LOW-E[®] THERMASHEET INSULATION

PRODUCT CODES: 4EMEX

PRODUCT DIMENSIONS & DESCRIPTION*

Double sided scrimless aluminum foil laminated to 1/8" (nominal thickness) polyethylene foam with 4" foil flange overlap.
WIDTH: 4'

LENGTH*: 125'

R-Value** : R-9 downward heat flow only

PERM RATING: ASTM E-96 0.008

FLAME AND SMOKE: ASTM E-84 Flame spread <25 Smoke developed <50

EMITTANCE: ASTM C-1371 0.03

* Additional lengths are available upon request and approval by ESP, Inc.

** SYSTEM R-VALUES FOR THESE INSTALLATION METHODS WERE CALCULATED USING DATA FROM THE 1989 ASHRAE HANDBOOK OF FUNDAMENTALS. R-values for Micro-E[®] materials can be higher or lower depending upon application.

Specific R-values for specific applications can be obtained from installation manual at www.low-e.com or by contacting ESP, Inc. at 1-800-289-5693

"R means resistance to heat flow. The higher the R-value, the greater the insulating power." "To get the marked R-Value, it is essential that this insulation be installed properly. If you do it yourself, get instructions and follow them carefully. Instructions do not come with this package." To obtain installation instructions visit www.low-e.com or call 1-800-289-5693

CAUTION: Do not allow product to become damp or wet while rolled in sealed bag
Do not set product directly on wet or uncured concrete

WARNING: Aluminum is an electrical conductor. Please use caution when working around electrical sources including overhead power lines. Carefully inspect electrical junction boxes and check for frayed wires before beginning installation

Note: ESP THERMASHEET is designed for use as a roofing underlayment primarily for clay tile an/or metal roofing systems.



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ESP LOW-E[®] TAB INSULATION

PRODUCT CODES: 16EFEC, 24EFEC, 18EFEC
PRODUCT DIMENSIONS & DESCRIPTION
Double sided scrimless aluminum foil laminated to 3/16" (nominal thickness) polyethylene foam
WIDTH: 16", 24", 18" respectively
LENGTH: 125' (16" & 24"widths) 100' (18"width)
R-Value* : R-11 down R-8 up R-7 horizontal
PERM RATING: ASTM E-96 0.008
FLAME AND SMOKE: ASTM E-84 Flame spread <25 Smoke developed <50
EMITTANCE: ASTM C-1371 0.03

* R-value results are obtained from ASTM C976. R-values for tab materials can be higher or lower depending upon application. Specific R-values for specific applications can be obtained from installation manual at WWW.LOW-E.COM or by contacting ESP, Inc. at 1-800-289-5693

"R means resistance to heat flow. The higher the R-value, the greater the insulating power." "To get the marked R-Value, it is essential that this insulation be installed properly. If you do it yourself, get instructions and follow them carefully. Instructions do not come with this package." To obtain installation instructions visit www.low-e.com or call 1-800-289-5693

CAUTION: Do not allow product to become damp or wet while rolled in sealed bag
Do not set product directly on wet or uncured concrete

WARNING: Aluminum is an electrical conductor. Please use caution when working around electrical sources including overhead power lines. Carefully inspect electrical junction boxes and check for frayed wires before beginning installation

Note: ESP Low-E[®] Tab Material is designed for use in stud cavities, joists, and truss/rafter applications.



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ESP Low-E[®] HouseWrap patent pending

PRODUCT CODES: 4PFNS, 5PFNS, 6PFNS

PRODUCT DIMENSIONS & DESCRIPTION:**

Single-sided aluminum foil with scrim product laminated to ¼" (nominal thickness) polyethylene foam

WIDTH: 48", 60", or 72" with overlapping flange

LENGTH: 125', 100', 100'

R-VALUE: R-4*

PERM RATING ASTM E-96: 7 or 40 grams/(day-m²)

WATER RESISTANCE: ASTM D779 – 9hrs

FLAME AND SMOKE: ASTM E-84 FLAME < 25 SMOKE DEVELOPED <50

*Horizontal heat flow behind vinyl siding with 0.375 inch airspace

**for actual dimensions of this roll see attached label with manufacturer's lot number

"R means resistance to heat flow. The higher the R-value, the greater the insulating power." "To get the marked R-Value, it is essential that this insulation be installed properly. If you do it yourself, get instructions and follow them carefully. Instructions do not come with this package."

To obtain installation instructions visit www.low-e.com or call 1-800-289-5693

CAUTION: Do not allow product to become damp or wet while rolled in sealed bag
Do not set product directly on wet or uncured concrete

WARNING: Aluminum is an electrical conductor. Please use caution when working around electrical sources including overhead power lines.

Note: ESP Low-E HouseWrap is designed for covering of external sheathing only.



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ESP LOW-E[®] ATTIC BLANKET INSULATION

PRODUCT CODES: 4PMPA, 4PMPA-SL, 24PMPA, 24PMPA-SL

PRODUCT DIMENSIONS & DESCRIPTION

Double sided scrimless aluminum foil laminated to 1/8" (nominal thickness) polyethylene foam perforated
WIDTH: 48"

LENGTH: 125'

R-Value*: R-5.5 down R-2.3 up

PERM RATING: ASTM E-96: 5.18 or 51.55 grams/ (day-m²) (based on single sided house-wrap)

FLAME AND SMOKE: ASTM E-84 Flame spread <25 Smoke developed <50

CRITICAL RADIANT FLUX: ASTM E-970 > .12 watts/cm²

EMITTANCE: ASTM C-1371 0.03

* R-value determined when placed over attic floor joist or existing insulation in joist area. R-value includes core material value and low emittance air film value for upward and downward heat flow respectively.

"R means resistance to heat flow. The higher the R-value, the greater the insulating power." "To get the marked R-Value, it is essential that this insulation be installed properly. If you do it yourself, get instructions and follow them carefully. Instructions do not come with this package." To obtain installation instructions visit www.low-e.com or call 1-800-289-5693

For detailed testing information please contact us at 1-800-289-5693.

CAUTION: Do not allow product to become damp or wet while rolled in sealed bag
Do not set product directly on wet or uncured concrete

WARNING: Aluminum is an electrical conductor. Please use caution when working around electrical sources including overhead power lines. Carefully inspect electrical junction boxes and check for frayed wires before beginning installation

Note: ESP Low-E[®] Attic Blanket is designed for use in residential attic floor spaces only.



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ESP **LOW-E** 

REFLECTIVE INSULATION
CLASS A WHITE



ESP LOW-E[®] CLASS-A WHITE INSULATION

PRODUCT CODES*: 4EFTW, 6EFTW(trimmed), 4EFWS, 6EFWS(staple flange), 4EFWZ, 6EFWZ(ez seal)

PRODUCT DIMENSIONS & DESCRIPTION*

One side scrimless aluminum foil, one side scrimless white foil, laminated to 3/16" (nominal thickness) polyethylene foam. Edges can be trimmed, with staple flange or with EZ-Seal self taped flange feature.

WIDTH**: 4', 6' respectively

LENGTH**: 125' (stock size 4'width) 84' (stock size 6' width)

R-Value*** : R-11.74 down R-8.58 up R-7.6 horizontal

PERM RATING: ASTM E-96 0.008

FLAME AND SMOKE: ASTM E-84 Flame spread <25 Smoke developed <50

FULL SCALE FIRE TEST: NFPA-286 Passed

EMITTANCE: ASTM C-1371 0.03

* This label refers to the Class A White line of insulation products supplied by ESP, Inc. and includes information on different widths and attachment features of the Class A White line. For information on specific product purchased refer to thermal label affixed to the roll of insulation

** Additional widths and lengths are available upon request and approval by ESP, Inc.

*** R-value results were calculated by GeoScience and were determined from 0.75" airspace and includes air film resistance.

Specific R-values for specific applications can be obtained from installation manual at www.low-e.com

or by contacting ESP, Inc. at 1-800-289-5693

"R means resistance to heat flow. The higher the R-value, the greater the insulating power." "To get the marked R-Value, it is essential that this insulation be installed properly. If you do it yourself, get instructions and follow them carefully. Instructions do not come with this package." To obtain installation instructions visit www.low-e.com or call 1-800-289-5693

CAUTION: Do not allow product to become damp or wet while rolled in sealed bag
Do not set product directly on wet or uncured concrete

WARNING: Aluminum is an electrical conductor. Please use caution when working around electrical sources including overhead power lines. Carefully inspect electrical junction boxes and check for frayed wires before beginning installation

Note: ESP ClassA White is a versatile product for many applications and industries.



Environmentally Safe Products, Inc.

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Other Important Information

FLAMMABILITY TESTING & MANUFACTURER'S WARNING

All ESP Low-E[®] Insulations have been tested in accordance with either the ASTM E-84 Surface Burning Characteristics for Building Materials or the NFPA 286 Full Scale Room Burn Test. The majority of ESP Low-E[®] Insulation product line meet the criteria in the Building Codes to be used in exposed building applications. Always consult your local building codes and officials before installing Low-E insulation if there are any questions concerning the building application. If there is any question concerning which product to use in your specific application, call 800-289-5693 and our representatives will be happy to assist you in choosing the correct product for your building.

MANUFACTURER'S WARNING: It is not recommended that these products be left exposed in walls and ceilings where ceiling height is less than 10 feet. If the product is to be installed in a building in the walls and ceiling with a ceiling height less than 10 feet, the wall should be covered with an approved thermal barrier (ex. gypsum board). Always consult your local building codes or officials before installing.

ASTM STANDARD TEST METHOD FOR SURFACE BURNING CHARACTERISTICS OF BUILDING MATERIALS:

This standard is used to measure and describe the response of materials, products, or assemblies to heat and flame under controlled laboratory conditions. ESP Low-E[®] products are tested within the strict standard of these test methods. This test method is not necessarily representative of the manner in which the ESP Low-E[®] products are installed in a typical field installation. The numerical ratings on all ESP Low-E[®] insulation products or any other materials are not intended to reflect hazards under actual fire conditions. ESP strives to have tests done as close as possible to the actual install methods.

Warning:

Aluminum is an electrical conductor. Please use caution when working around electrical sources including overhead power lines.

NOTE: Rolls of insulation shall be packaged in a polyethylene wrapping. Insulation shall be stored in a dry protected area. Do not allow insulation to come in contact with fresh concrete at any time. Any tears or punctures in the foil shall be repaired with aluminum tape. All seams that require taping must be taped with ESP approved tape.

PRODUCT GUARANTEE & MANUFACTURER'S WARRANTY

Product Guarantee

ESP Low-E[®] Insulation products are guaranteed against defects in material and workmanship for 20 years. Blister or bubbles in product surface will not affect performance. Product thickness for products with foil on both sides may vary +/- 10%. All other products may vary +/- 20%.

Defective Material

The following criteria may be considered a defect; (1.) 1 inch wide or more of foil delamination on the edges for more than 15 feet of the roll. (2.) More than 1 inch of core showing on 20 feet or more of a roll. (3.) Large areas (more than 1 square foot) of delaminated foil.

Corrective Instructions

Occasionally there may be imperfections in product that may affect appearance but not performance. In the event this is encountered, the following solutions are advised; (1.) If there is core showing on one side, either tape the seam on that side when installed or install product with the core side in. (2.) If there is an edge that is delaminated, either tape the seam on that side when installed or install product with delaminated edge in. (3.) If there are areas that have a delamination that cannot be installed without correcting this defect, the following may be done with an iron; set the iron about half to three quarters temperature setting. Make a small slit with a razor knife in the center of the delamination and carefully, with light pressure, iron the foil towards the slit, allowing trapped air to escape. When finished, cover the slit with a small piece of Low-E tape.

Return Policy

(1.) It is our opinion that our Distributors should handle customer problems directly and ESP in turn will issue a credit or replace materials to the Distributor. The Distributor must make available to ESP a copy of the product label or the information on the label [lot#, initials, product description], samples of the defect, or the roll of material. Upon inspection of the defect, ESP will credit or replace defective material at ESP's discretion. If a section of a roll is bad, remove the bad area and use the rest of the roll. Retain the bad section and label information for credit. If label is not available, return the bad section. (2.) All labels on the product must be saved for verification. If label is not sent back with completed filled out complaint form, the complaint will not be acknowledged. If everything is in order on the complaint form and sheets and ESP requests the return of the roll, ESP will pay the shipping, however, **no material is to be returned without ESP approval.** (3.) If the customer elects to keep all the product that is considered seconds, and the complaint forms and labels are sent back, ESP will credit the customer for the difference in first quality and second quality pricing. (4.) If the product is shipped out of the continental United States, the representative is totally responsible for all replacement costs and shipping charges of the material.

DISCLAIMER



R-values in this manual are achieved with ESP Low-E[®] Products having foil facings with .03 emittance on both sides. Low-E products with a white foil facing will have a lower R-value. Please consult your manufacturer's representative for the thermal performance of these products.



The Low-E Advantages



Stops Heat - Deadens Sound Does Not Absorb Moisture

- * Low-E products offer Class A, Class 1 fire ratings.
- * Low-E provides a continuous thermal break around purlins, girts, studs and joists.
- * Low-E is so thin that oil canning of your metal roofing/siding is never a problem.
- * Low-E is an excellent vapor barrier and helps control condensation.
- * Low-E's low emittance surface keeps buildings cool in summer and warm in winter.
- * Low-E's strong lightweight rolls make installation a breeze.
- * Low-E doesn't easily tear even in windy conditions. 
- * Low-E can be installed alone and outperform up to 3"- 4" of fiberglass.
- * Low-E can be combined with fiberglass for higher R-Value code requirements.
- * Low-E rolls are available in various widths and thicknesses with or without a staple flange.
- * Low-E closed micro-cell foam seals tightly around fasteners.
- * Low-E doesn't wick moisture into the core of the insulation.
- * Low-E deadens sound. 
- * Low-E is bird, mice and insect resistant.

Low-E, The #1 Choice of Quality Builders

DISCOVER even more ways to lower energy costs with ESP LOW E[®]



Green building is not just a trend, but the wave of the future as more and more homeowners and builders demand energy efficient homes and products. ESP LOW-E[®] Insulation products are designed for maximum energy and cost efficiency. Whether its under slab, under roof, around duct work or wrapping the

entire house, ESP LOW-E[®] Reflective Insulation saves more money on heating and cooling than regular insulation and housewrap.

Check out all the ways ESP LOW-E[®] Insulation can help reduce your energy consumption around the home.

For more information on ESP LOW-E[®] Insulation products and individual specifications contact Environmentally Safe Products, Inc. at 1-800-289-5693, or visit us online at

ESP LOW-E[®]

REFLECTIVE INSULATION
YOUR EVERYDAY INSULATION SOLUTION



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