www.Radiant-Technology.com
Composites

Technical Data and Specifications

Radiant Technology Composites

Item Code	Item	Description
#1 RTCM01 "The Real Stuff"	Radiant Technology Commercial Material	Used for Metal & Pole Building Insulation
#3 RTSSF1	Radiant Technology Single Sided Reflective Insulation	Designed to reflect low heat loads on one side only. A/C Duct and Chiller Lines
#4 RTDSF1	Radiant Technology Double Sided Reflective Insulation	Used where there is no air space; where only thermal heat is a factor. Available with adhesive on both sides.
#5 DSRIP1	Radiant Technology Double Sided Reflective Insulation with Acoustical Foam	Used inside truck and tractor cab ceilings & walls. Available with adhesive on both sides & can be laminated to cab interiors with a Peel & Stick system.
#6SSFSM02 ¼" or ½"	Radiant Technology Single Sided Fire Seal Reflective Insulation	Used for reflecting high heat loads on one side. This is a fire proof foam. It can have adhesive on one side. Firewalls - any areas where heat is greater than 200°F. Only reflects on one side. Available in ¼" or ½"
#7 DSFM01 ¼" or ½"	Radiant Technology Double Sided Fire Seal Reflective Insulation	Designed for reflecting high heat on either side. Used where no air space is available. Available in ¼" or ½" foam and can have adhesive on both sides.
#8 SSFW2A1	Radiant Technology Single Sided Fire Seal Insulation with 2 Frequency Acoustics.	Used under floor mats of tractors where High Heat & Noise are a Factor.
#9 DSW2A01	Radiant Technology Double Sided Reflective Insulation with 2 Frequency Acoustics.	Used under the floor mats of agricultural tractors and truck tractors top application.
#10 DSE2A02	Radiant Technology Double Sided Reflective Insulation with 2 Frequency Acoustics.	Used under the floor mats of agricultural tractors and truck tractors bottom application.
#11 RTHAF31	Radiant Technology High Acoustical Foam	Designed for use in and around Generator Sets. Material features two barriers and one dampener. Available in 1" Thickness. Rolls are available in 54" x 25'
#12 RSSFSM01	Radiant Technology Reinforced Single Sided Fire Seal Insulation	Used for reflecting heat on one side. This is a Reinforced Fire Proof Material. Primarily used on Engine Side Fire Wall for heat and Noise. The thicker the material, the greater the noise attenuation.
RT TAPE	Radiant Technology Reinforced Tape	Available in 2" by 3"

Radiant Technology Composites

RADIANT TECHNOLOGY RESIDENTIAL MATERIAL

This foil membrane act as a radiant barrier when placed in an air space. Radiant barrier when perforated has a water vapor permeability of over 70 grams per square meter per 24 hours (perms).

TYPICAL PROPERTIES

Product Makeup—Foil-Face Woven Polyethylene

The product is manufactured from two reflective sheets of 99.5% pure industrial grade aluminum with a polyethylene insert to provide a thermal break. It is perforated to prevent moisture condensation and a nylon scrim is added to increase the strength.

Emissivity ASTM E408	.03 (amount of potential radiant heat transfer)
Reflectivity ASTM E408	.97 (degree of reflectance of thermal radiation)
Caliper .004	
Tensile Strength MD (lbs/inch width) CD	54.0 18.05
Smoke Density ASTM E84	10
Flame Spread ASTM E84	10
Weight per 1000 ft²	18 lbs.

Standard Roll dimension 48” x 6” x 250’

Radiant Technology Composites

PHYSICAL PROPERTIES

OF

ALUMINUM FOIL

Density	0.0976 lb/in
Specific Gravity	2.70 (approx.)
Melting Range	1190E-1215E
Electrical Conductivity	59°IACS, Vol., 200% IACS (approx.,), weight
Thermal Conductivity	53 CGS units at 25°C
Thermal Coefficient of Linear Expansion	13.1 x 10^-6, per F from 68° to 212°F
Reflectivity of white light, Tungsten filament lamp	85% to 88%
Reflectivity for radiant heat; from source at 100E F	95% (approx.)
Emissivity, at 100E	5% (approx.)
Atomic number	13
Atomic Weight	26.98
Valence	3
Strongly Electropositive	1.5/v
Specific Heat at 20EC	0.21-0.23 cal/gm/°C
Boiling Point	3200°F
Temperature Coefficient of Resistance for Alumi-num	(Representative values per °C)

Temperature °C	Coefficient
20	0.0040-0.0036
100	0.0031-0.0028

Low temperature properties — Aluminum increases in strength and ductility as temperature is lowered, even down to –320°F.

Radiant Technology Composites

TABLE OF PROPERTIES

Radiant Technology
Double-Sided Reflective
Insulation
(RTDSF1)
4

PROPERTY NATURAL	PROPERTY FACTOR	TEST STANDARD	POLYPROPELYNE
Specific Gravity	1= Water	D792	.90-.91
Density	lb/in^3	D792	.033
Tensile Strength	PSI	D638+	4000-6000
Elongation	%	D638+	100700
Compressive Strength 1%P	SI	D695	3500-8000
Flexural Strength	PSI	D790	5000-8000
Impact Strength, Izod	ft/lb/in of notch	D256A	.4-1.0
Hardness	Rockwell	D785	R80-100
Thermal Conductivity	BTUin/br/ft E/F	C177	1.22-2.8
Thermal Expansion	10^5in/in F	D696	5.8
Resistance to Heat F	Continuous	—	200
Melt Point F	EF	D1525	>275
Brittleness Temp. F	EF	D7646	-20 to 32
Deflection Temp 264psi	EF	D648	115-140
Deflection Temp 66psi	EF	D648	185-250
Volume Resistivity	ohm/cm	D257	6.5 x 10^16
Dielectric Strength	V/10^3in	D149	600-650 (1.25)
Dielectric Constant	50-100 Hz	D150	2.1-2.3
Dielectric Constant	10^3 Hz	D150	2.1-2.3
Dielectric Constant	10^6 Hz	D150	2.1-2.3
Dissipation Factor	50-100Hz	D150	.0003
Dissipation Factor	10^3 Hz	D150	.0003
Water Absorption 24 hr	%	D570	.01-.03
Water Absorption Saturation	%	—	.01-.03
Burn Rate	Description	D635	Burns
Effect of Sunlight	Description	D543	Affected
Wear Factor (k)	K x 10^10	—	—
Coefficient of Friction	Dynamic	—	—

Radiant Technology Composites

Product Data

Fire-Seal Institutional Foam
Physical Properties

TEST	TEST METHOD	TYPICAL VALUE
Density	ASTM-D-3574 (A)	6 PCF +/-.5
Indentation Force Deflection @ 25%	ASTM-D-3574 (B1)	35 +/- 10 M
Compression Test	ASTM-D-3574 (D)	20% Maximum
Tear Resistance	ASTM-D-3574 (F)	2 PSI Minimum
Tensile Strength	ASTM-D-3574 (E)	10 PSI Minimum
Elongation to Break	ASTM-D-3574 (E)	110% Minimum

Fire-Seal Institutional Foam
Flammability

TEST	TEST METHOD	TYPICAL VALUE
Radiant Panel	ASTM-D-3675	.5 or Less (No Melt/No Drip)
Oxygen Index	ASTM-D-2863	65% Minimum
Underwriters Laboratory (UL) Flame Resistance	UL 94 HF– 1	Pass
Flame Retardance Resilient Filling Material Used in Upholstered Furniture	Cal X 117 Section A Section D	 Pass Pass
Flammability of High Risk & Public Occupancy Mattresses	Cal X 133	Pass
Flammability of High Risk Seating	Boston Fire Code	Approved
Federal Aviation Administration Flammability of Aircraft Seating	FAR 25.853 Part II Appendix F	Pass
Federal Aviation Administration Compartment Interior	FAR 25.853 Volume III Para (A) Para (B)	 Pass Pass
Department of Transportation	Motor Vehicle Safety Standard X 302	Pass

Radiant Technology Composites

Product Data

Fire-Seal Institutional Foam
Smoke Generation

TEST	TEST METHOD	TYPICAL VALUE
National Bareau of Standards (MBS Smoke Chamber Test) Smoke Generation Characteristics of Foam	ASTM-E-662	

FLAMING MODE	TYPICAL VALUE
Ds @ 1.5 Minutes	40 Maximum
Ds @ 4.0 Minutes	70 Maximum
D Maximum	100 Maximum

SMOLDERING MODE	TYPICAL VALUE
Ds @ 1.5 Minutes	40 Maximum
Ds @ 4.0 Minutes	70 Maximum
D Maximum	100 Maximum

*All testing performed at 1" Thickness

Fire-Seal Institutional Foam
Toxicity

TEST	TEST METHOD	TYPICAL VALUE
McDonnel-Douglas Acute Relative (Count of Los Angeles Purchase Standard No. 951-3 (3-85)}	MASA CA-152056 Toxic Gas Affect on Living Organisms (Mice) Fuel Source: 1 gram test material Heat Source: 3.5 amps for 200 sec a. Time to incapacitation not less than 15 min +/- 30 sec. b. Time to death not less than 30 min +/- 30 sec.	a. Pass b. Pass

TEST	TEST METHOD	TYPICAL VALUE
McDonnel-Douglas Acute Relative Toxicity Test	MASA CA-152056 (Enhanced) Toxic Gas Affect on Living Organisms (Mice) Fuel Source: 2 gram test material Heat Source: 7 amps for 200 sec Total Test Time: 30 Min. a. Time to incapacitation not less than 15 min +/- 30 sec. b. Time to death not less than 30 min +/- 30 sec.	a. Pass b. Pass

Radiant Technology Composites

NOISE BARRIER/ABSORBER COMPOSITE
RTHAF31 W/GLUE
11

FOAM

Type	Polyurethane/polyester
Density	2.0 lbs./ft^3
Color	Charcoal gray
Thickness/decoupler	1/4”
Thickness/absorber	3/4”
Service Temperature	-40EF low, 225EF high
K factor @ 30EF	.26 BTU in/hr x ft x EF

VINYL BARRIER

Type	Flexible polyvinylchloride
Thickness	3/32 inch
Weight/Thickness	1.0 lbs/ft
Color	Charcoal gray

ADHESIVE

(decoupler foam side)	Pressure-sensitive 4 mils thick un-supported acrylic

FACING

(absorber foam side)	Aluminized polyester (mylar) 2.5 mils thick, reinforced with coated fiberglass fabric

FLAMMABILITY

MVSS 302

ACOUSTICAL PROPERTIES

Frequency in Hz	125	250	500	1K	2K	4K	
Sound Transm. Loss in dB	21	27	30	25	43	62	STC 30(1)
Sound Abs. Coefficients	.17	.55	.55	.19	.41	.37	NRC.45(2)

(1) Ref. Riverbank Acoustical Laboratories, Test TL82-183
(Composite adhered to 16 ga. sheet metal.)
(2) Ref. Riverbank Acoustical Laboratories, Test A91-100

AVAILABILITY

Rolls	54” wide x 25 ft
Sheets	54” wide x specified length
Die-cut Parts	As specified

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Testing in Different Applications

Radiant Technology Composites

The following are the results of a 5th wheel unit with the Radiant Technology #4 material in it. Testing done in unit roof. The insulation is placed under OSB board and on top of fiber glass.

Units Tested, each had one identical roof mounted A/C unit. 13,500 BTU

Test we are identifying is an A/C pull down. Heat room heated +110°F. Thermostat set at 70°F A/C unit turned on and units began pull down.

Unit #1 without Radiant Technology insulation took three hours to pull down 70°F and held for a total of four hours.

Unit #2 with Radiant Technology insulation material took one hour to pull down to 70°F— Thermostat was lowered to 60°F and unit at the end of a seven hour test had pulled down to 60.5°F and held it.

This shows how the material reacts with a saturated heat load and demonstrates that the material will insulate and produce a calculated R value which is as great as the A/C unit can provide.

The difference between 60.5°F and 110°F is 49.5°F and you cannot get it any greater unless you have a compressor design too take it further.

These test show that the integration of these space age materials improve the comfort level of each and every unit that uses it. This is a very affordable option and does not interfere with current construction of the units.

Radiant Technology Composites

Test done with Eagle Series Dina Truck

Truck Number	D-9400435
Series Number	223*4337C3
Motor Number	43146911
Make	Cummins
Model	N14-435
Maximum Potential	435 HP @ 1600 RPM
Maximum Torque	1550 Lb-Ft @ 1200 RPM
Transmission	14 Speed Spicer

Temperature in °F with A/C off. Windows Closed. On an up-climb in a five hour test.

	Exterior	Interior	Exterior	Interior
Firewall Right	190.4	89.6	192.2	89.6
Firewall Center	199.4	95.0	188.6	95
Firewall Left	172.4	84.2	179.6	86
Floor Right Front	156.2	87.8	161.6	86
Floor Right Back	150.8	78.8	150.8	80.6
Floor Center Front	181.4	80.6	183.2	82.4
Floor Left Front	143.6	84.2	149.0	84.2

	Exterior	Interior	Exterior	Interior
Firewall Right	190.4	89.2	192.2	91.4
Firewall Center	188.6	95	188.6	96.8
Firewall Left	179.6	86	177.8	89.2
Floor Right Front	161.6	84.2	161.6	86
Floor Right Back	150.8	82.4	156.2	84.2
Floor Center Front	185.0	82.4	192.2	84.2
Floor Left Front	186.8	86	152.6	87.8

	Exterior	Interior	Materials Used
Firewall Right	192.2	89.2	SSFSMO1 1/4 W/GLUE
Firewall Center	190.4	95	SSFSMO1 1/4 W/GLUE
Firewall Left	179.6	87.8	SSFSMO1 1/4 W/GLUE
Floor Right Front	165.2	84.2	DSFSSFS 1/4 W/GLUE
Floor Right Back	159.8	82.4	DSFSSFS 1/4 W/GLUE
Floor Center Front	192.2	82.4	RTDSF1 W/GLUE
Floor Left Front	149.0	87.8	RTDSF1 W/GLUE

SSFSM01 1/4 W/Glue= Single sided fireseal with glue
RTDSF1 W/Glue= Double sided foam with glue
DSFSSFS W/Glue= A combination of the SSFSMO1 1/4 W/Glue & RTDSF1

Results of Various Studies on The Effect of Radiant Barrier

Summer & Winter Tests

Test Facility	Conditions	Results (% Reduction of Heat Transfer)
Oak Ridge Federal Lab	**Summer Test** A. Radiant Barrier in Roof Truss with R-19 insulation B. Radiant Barrier on Top of R-19 insulation	28% 39% 35%= 17% reduction in Electrical Consumption
Tennessee Valley Authority	**Summer Test** A. Radiant Barrier in Roof Truss with R-19 insulation B. Radiant Barrier on Top of R-19 insulation **Winter Test** (Temperature as mild as 65°) A. Radiant Barrier in Roof Truss with R-19 insulation B. Radiant Barrier on Top of R-19 insulation	34% 44% 12% 23%
Florida Solar Energy Center University of Mississippi	**Summer Test** Above R-19 insulation On Top of R-19 insulation	45% 45%
Northeastern Illinois University	**Winter Test– 1984** On Top of R-19 insulation	30-50%
Northeastern Illinois University	**Winter Test– 1982**	29 % Over Entire Winter
Texas A&M University	**Summer Test** A. One Sided Barrier on top of R-19 insulation B. Two Sided Barrier on Top of R-19 insulation	46% 78.2%

CASE HISTORY OF A WINTER

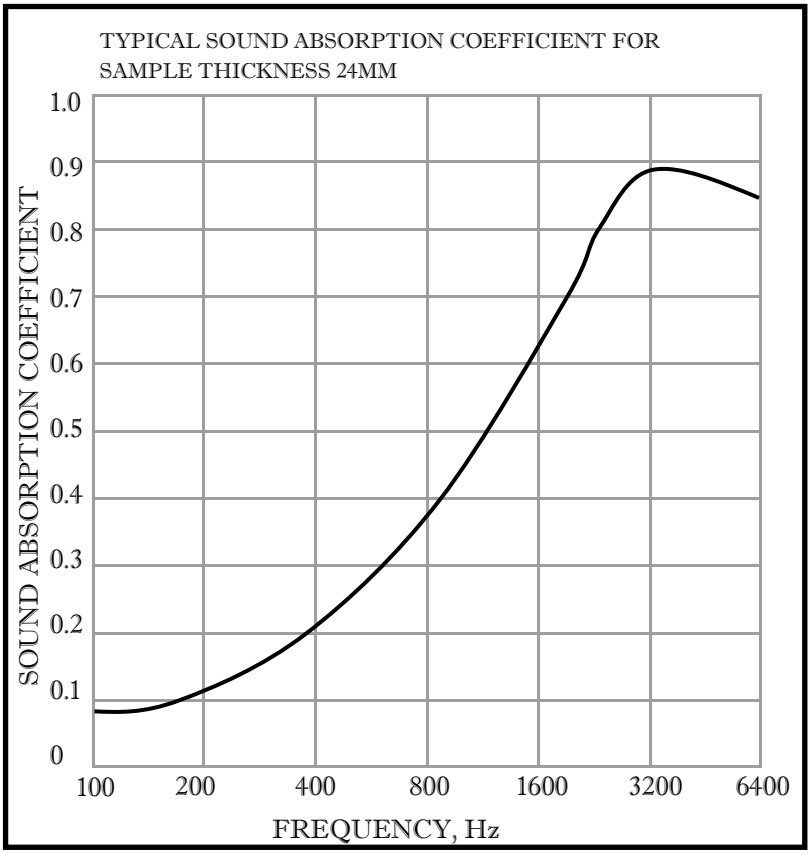
Northeastern Illinois University, Department of Earth Sciences, Feb. 1982

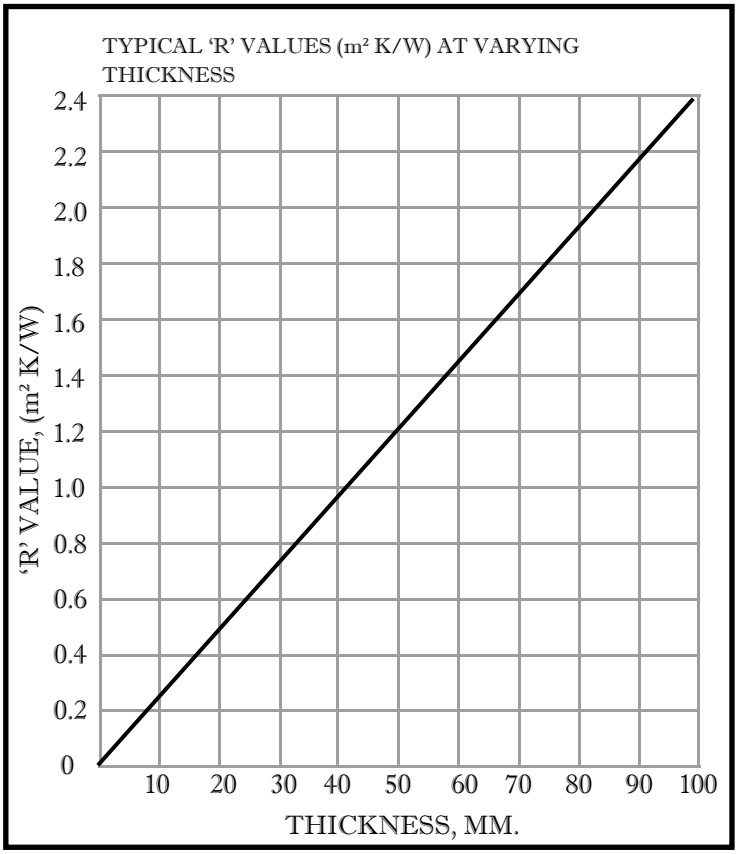
29 % LESS FUEL USED WITH FOIL RADIANT BARRIER
SAVED $580 PER YEAR (1981 PRICES)
50% RETURN ON INVESTEMENT
PAYBACK—2 YEARS

Location:.....	Winnetka, Il.
Building Type:.....	Two story Victorian, residential
Square Footage:.....	2300 Square Feet applied to roof rafters
Existing Insulation:.....	6” fiberglass batts, 2” vermiculite
Building Heat:.....	Forced Air, Gas
Cost of Installation:.....	$1,150
Other Comments:.....	Monitored closely by University Science Professor using indoor and outdoor recording thermometers with analysis of fuel use per degree day.

Product Data

Fire-Seal Insulation Foam





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Composites

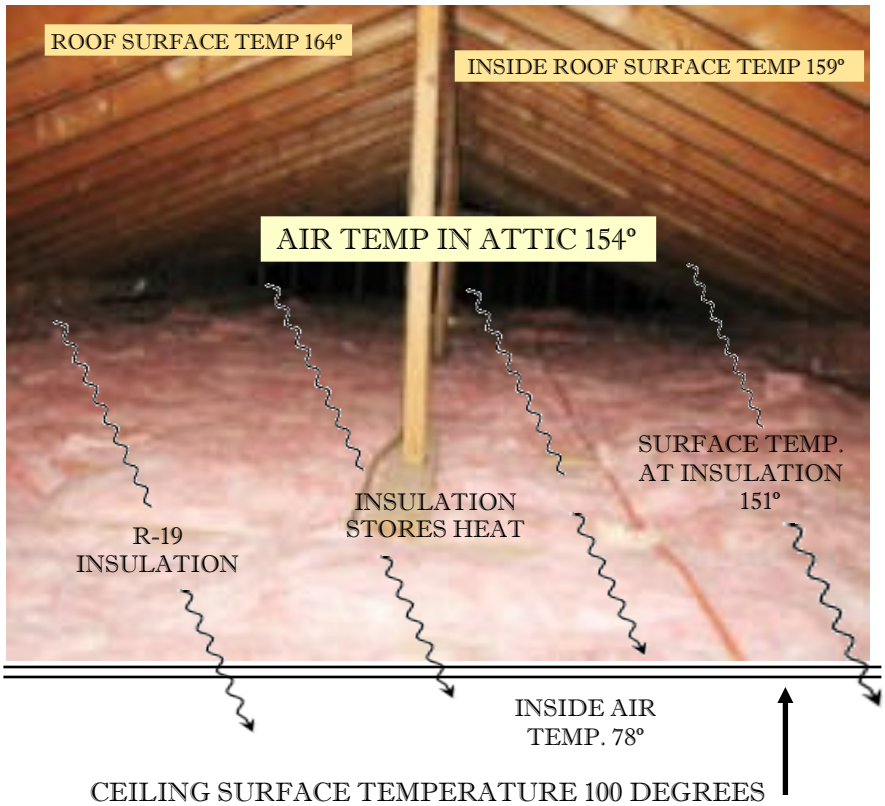
Applications

RESULTS OF A SIDE BY SIDE TEST
CONDUCTED IN DALLAS, TEXAS, JULY 1980

TEST HOMES EACH:
R-19 Ceiling Insulation
A-11 Wall Insulation
3528 square feet
Same Appliances
Same A/C Units

TEST HOME A:
No Radiant Barrier
5383 kwh used @ $325.00

NO RADIANT BARRIER

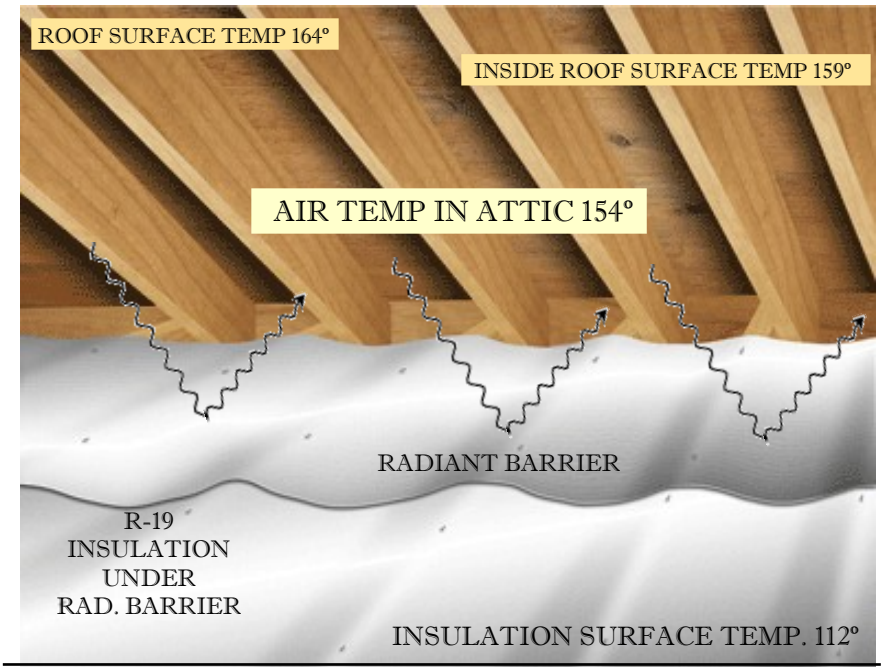


CEILING SURFACE TEMPERATURE 100 DEGREES

TEST HOME B:

Radiant Barrier in Ceiling and walls. Reflective tape also used around doors and windows. 2054 kwh used @ $117.00

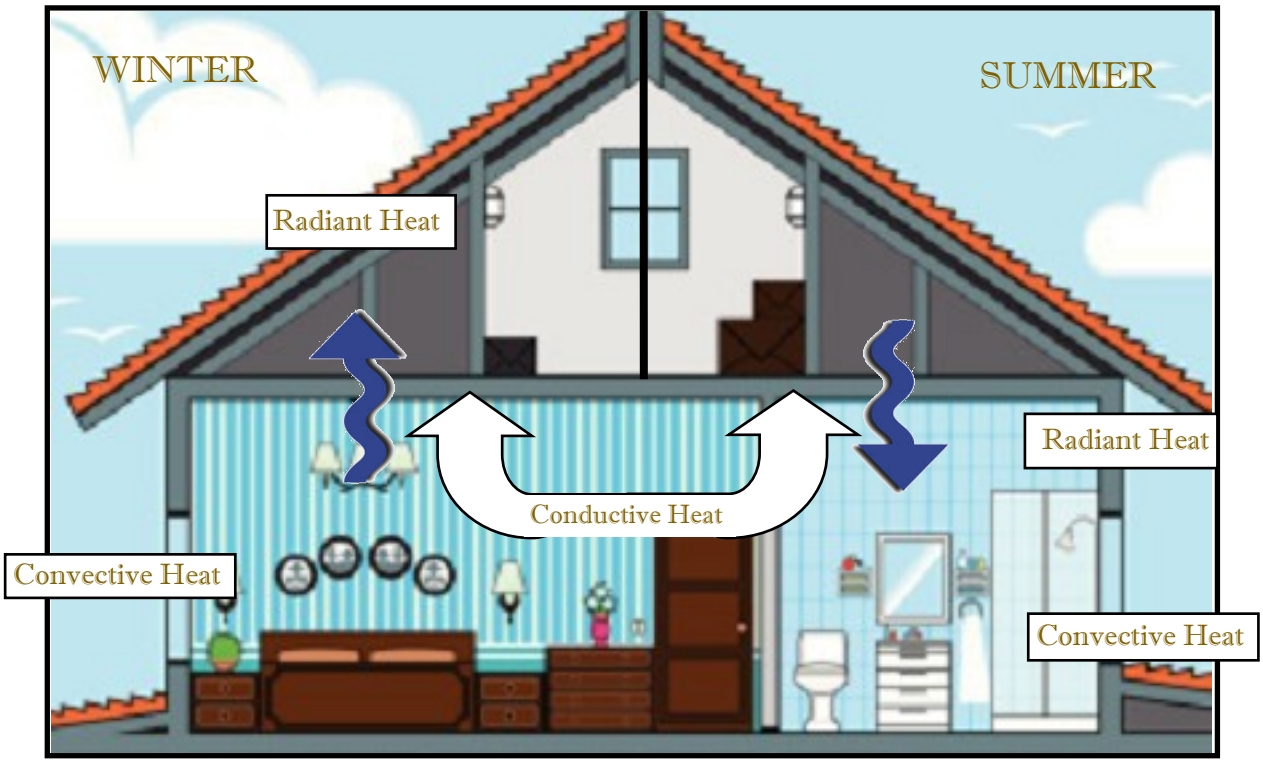
WITH RADIANT BARRIER



CEILING SURFACE TEMPERATURE 78 DEGREES

Reducing Heat Transfer

"Lower Utility Cost"



Conductive Heat: Insulate

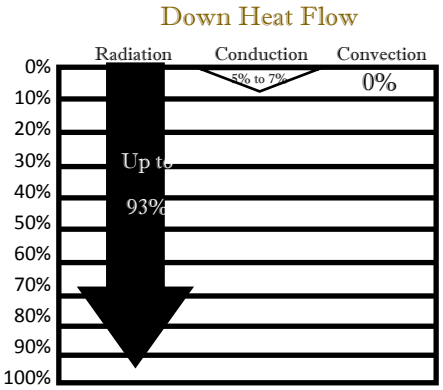
To slow down conduction we install insulation in our ceilings and walls. Insulation absorbs heat and conducts it to a cooler climate. The rate of this conductive transfer is determined by the insulation "R" value. "R" value is the resistance to heat flow through the material. The higher the "R" value, the slower the heat transfer.

Convective Heat: Weatherstrip & Dampers

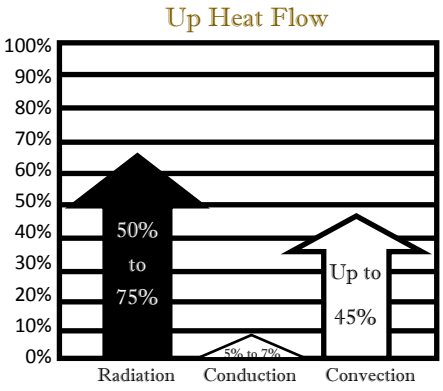
To slow down convective air currents, we weatherstrip the cracks around our doors and windows and install dampers in our fireplaces and in the flu's of our furnace.

Radiant Heat: Radiant Barrier

Radiation is the Primary Mode of Heat Transfer

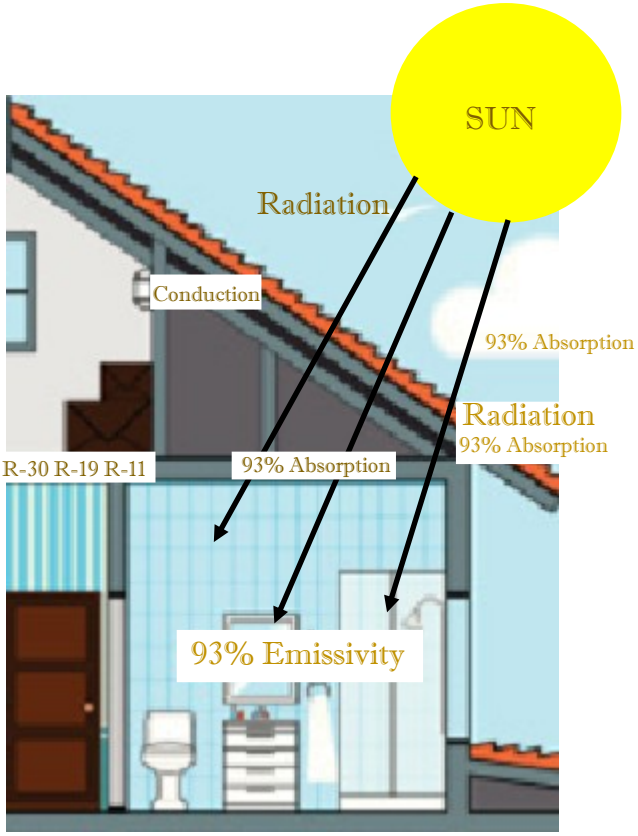


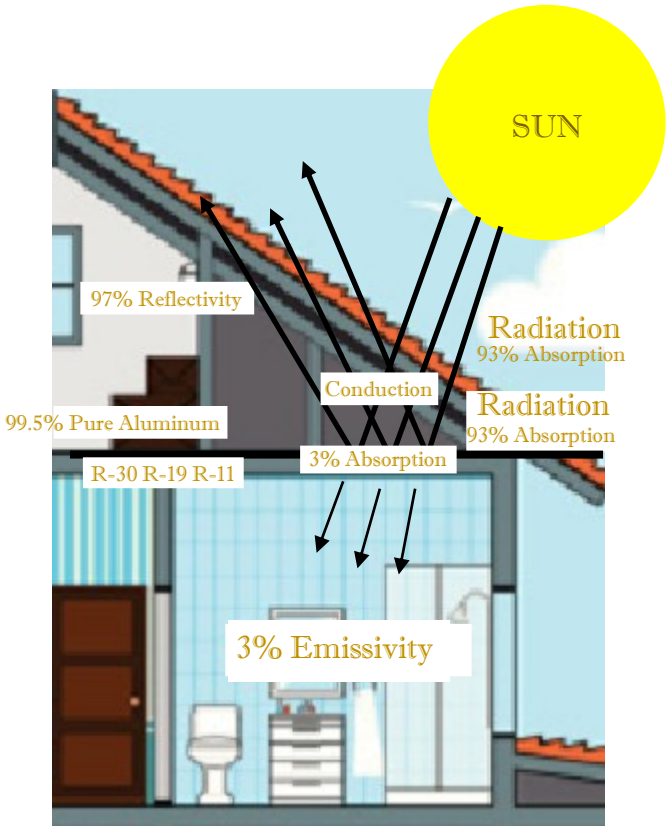
SUMMER HEAT GAIN
THROUGH CEILING/ROOF



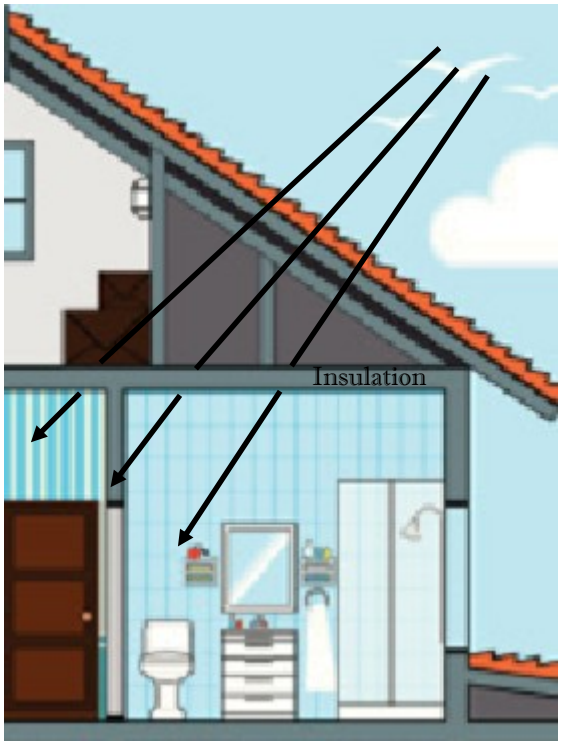
WINTER HEAT LOSS
THROUGH CEILING/ROOF

How Radiant Barrier Works





SUMMER TEST

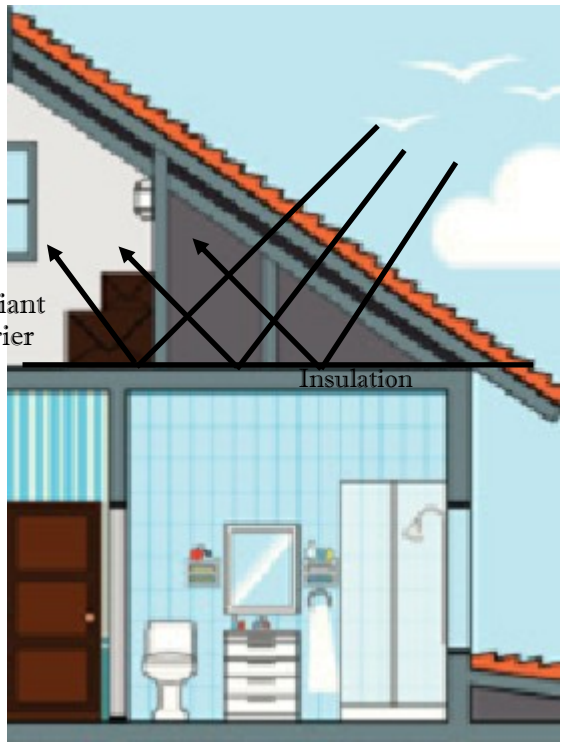


WITHOUT

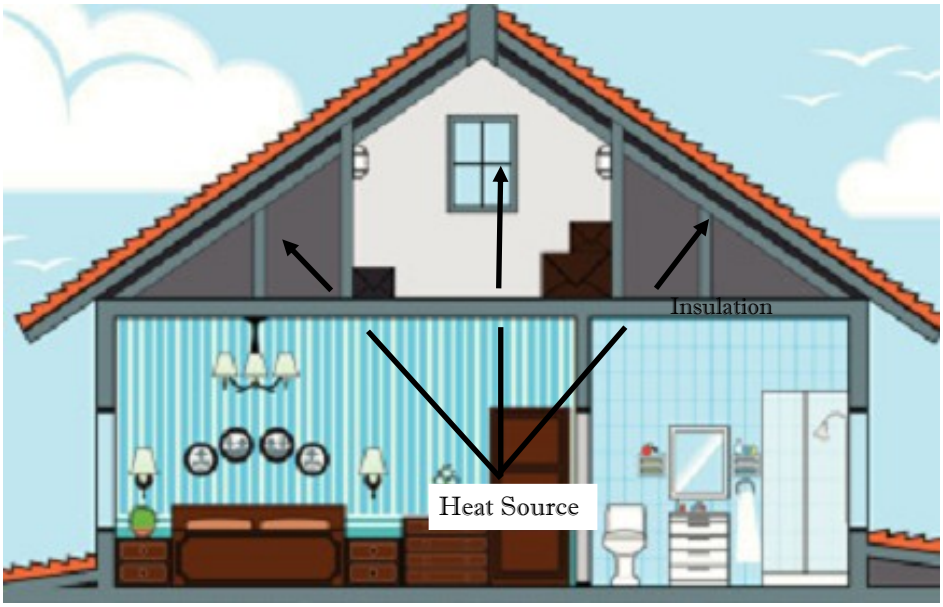
RADIANT BARRIER

WITH

RADIANT BARRIER



WINTER TEST

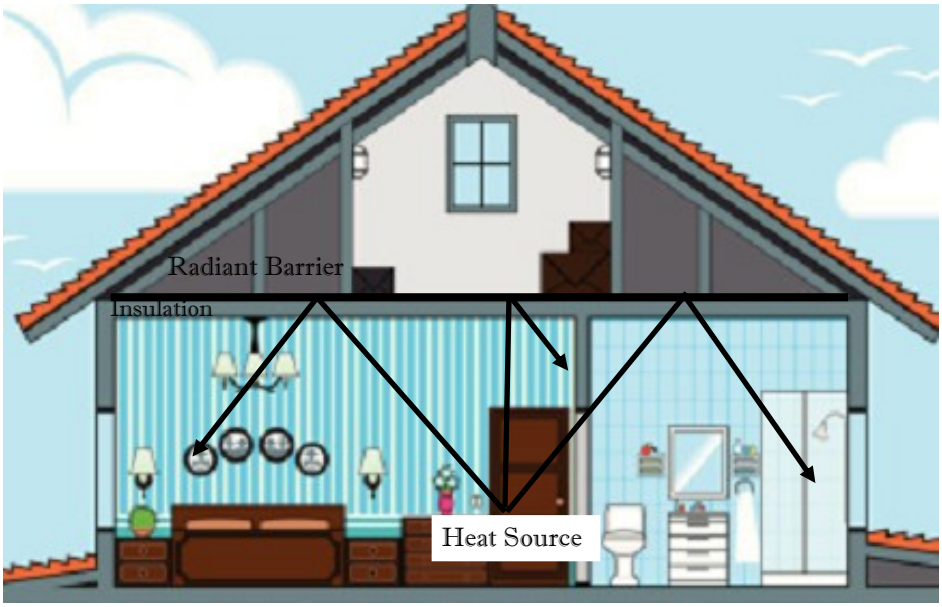


WITHOUT

RADIANT BARRIER

WITH

RADIANT BARRIER



Radiant Technology Composites

Revolutionary insulation packages from Radiant Technology have an insulating value greater than 20 inches of mass insulation. Our unique products will keep you warmer in the winter and cooler in the summer.

How can this be possible?

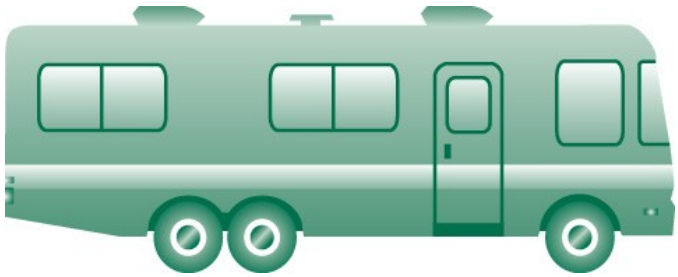
After researching the superior insulation technology used in the space program, Radiant Technology has taken this knowledge and reproduced it into an easy to use, affordable product called Radiant Technology Reflective Insulation. Unlike mass insulation, Radiant Technology Reflective Insulation doesn't absorb heat which causes heat transfer, but instead reflects heat from both sides. This means that in the winter any heat generated within the interior of the fifth-wheel is contained for the warmest interior possible. In the summer, heat is deflected from entering the interior of the fifth-wheel allowing the air conditioner to cool more efficiently. Radiant Technology Reflective Insulation has been tested in the extremes of the desert in temperatures of 140°F and in cold areas of –50°F.

Reflective Thermal Insulation used in roof area.

Reflective Thermal Insulation used in floor.

FIFTH-WHEEL TRAVEL TRAILERS

CONVENTIONAL TRAVEL TRAILERS



CLASS A MOTOR HOME

CLASS C MOTOR HOME

Benefits of Reflective Insulation

1. Provides a constant vapor barrier.
2. Thermally will improve the efficiency of A/C Heater unit no matter what climate.
3. Will extend the life of A/C Heater unit.
4. Will provide the efficiency of LP furnace.

The following is a short article of why the FAA is considering replacing any insulation containing metallized Mylar for fire resistant insulation such as the insulation manufactured by Radiant Technology

FAA may tell airlines to replace insulation

By Alan Levin
Wed., Aug 11, 1999
USA TODAY
FINAL EDITION
Section: NEWS
Page 4A

U.S. airlines would have to replace dangerously flammable insulation on more than 700 jets according to a proposal soon to be announced by federal officials, USA TODAY has learned. The proposed order would be costly, and airlines contend it could require some of them to take jets temporarily out of service. The order is far less dramatic than the Federal Aviation Administration predicted last fall when it first announce it was stepping up efforts to review the safety of insulation material.

The proposed FAA order would require airlines with MD-80,MD-90, MD-11 and DC-10 jets to replace the insulation that rests just inside the aircraft skin because it was found to catch fire too easily, according to people who have been briefed on the FAA's plans.

The insulation, similar to household insulation, protects against extreme temperature changes and reduces interior noise.

The Swissair MD-11 that crashed Sept. 2 off Nova Scotia contained the same insulation material, known as metallized Mylar, named in the proposed FAA order. The cause of that crash has not been identified, but the flight crew reported smoke and investigators found evidence of fire in the jet's ceiling area. All 229 people aboard were killed.

The FAA also is preparing a more comprehensive series of regulations to be announces later this year that would require that the insulation blankets be composed of materials that also resist jet-fuel fires outside the fuselage, USA TODAY has learned. Such a rule would give people more time to escape after a crash, but the FAA has not said how broadly the rule would be applied.

Airlines say they support the replacement of insulation containing metallized Mylar. But in recent days they have asked the FAA to postpone its order so that a test replacement can be conducted.

"Foremost among our concerns is the potential for disturbing wiring during the insulation replacement process in such a way that would increase the likelihood of wiring failures," said a letter dated Aug. 4 from the Air Transport Association, the airlines' trade group, to the FAA.

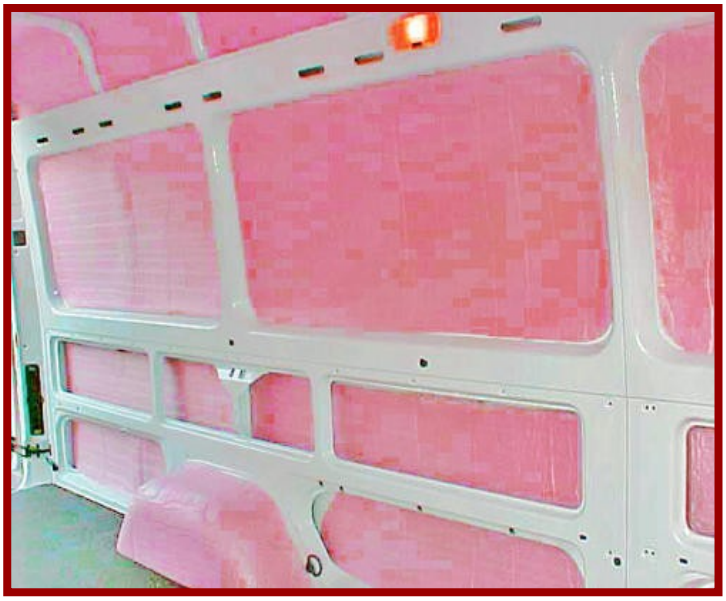
The airlines have estimated that the replacement would cost as much as $1 million per aircraft, or more than $700 million for the entire fleet of jets affected. Some officials say the cost would be far less because the FAA requires a partial removal of insulation blankets during heavy maintenance performed every few years.

The proposed rule gives airlines four years to comply. An estimated 729 jets would fall under the order. It would be subject to public comment before taking effect.

The FAA's proposed action falls far short of the 5,000 aircraft that officials predicted last year could be affected by an insulation replacement order. FAA technicians found that other materials were not as flammable as they had feared.

Radiant Technology Composites

INSULATION FOR VAN CONVERTIONS



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Composites

Explanations and Calculations of R-Values

Radiant Technology Composites

RADIANT SHIELD INSULATION TRAINING INFORMATION

Radiant Shield insulation isn't new, to motor coaches, travel trailers, 5th wheel trailers or commercial applications. This is the technology used to insulate Space Shuttles, space suits used outside the shuttle and other spacecraft. Radiant Technology reflective insulation is our designated name for this type of insulation.

The unique feature that separates this insulation from the conventional fiberglass, wool and foam insulation is the heat transfer mechanism. Most conventional insulation slows the conduction of heat through the material. Radiant Shields and our reflective insulation reflect the heat back where it came from.

Heat flows from the higher temperature to the lower temperature by three mechanisms: Conduction, Convection and Radiation.

1. Conduction is the movement through materials and from one material to another when they are in intimate contact.
2. Convection is heat flow through a moving gas or liquid.
3. Radiation is where the heat transfer is in the electromagnetic spectrum (infrared), like feeling the sun on your face.

With these basics in mind lets look at the resistance to heat flow in a simple insulation system. The simplest system is a wall using conduction resistance only. The high temperature flows towards the low temperature and the flow is resisted by the insulation.

Conductive insulation is listed with an R-value; which as you can expect id the resistance to heat flow. The higher the R value the better the insulation resistance and the more the heat flow is slowed. The R-value is based on the material and the thickness. The same material applied twice the thickness has twice the R-value. For each inch of thickness of fiberglass in the wall the R-value is 3.7. If you put 1 ½ inch thickness of fiberglass in the ceiling of a typical coach you get an R-value of 5.6 (3.7X1.5=5.6). This is basically what comes in a typical coach. As a comparison, urethane foam has an R-value of about 7.2/inch (there is a wide range of R values for foam). If this were placed in the ceiling of a coach with 1½inch space the R– value of the insulation would be 10.8 (7.2X1.5=10.8). Pretty much double the R-value of the insulation of fiberglass; a pretty good improvement, we've cut in half the flow of the heat through the insulation for any given temperature difference. The foams are pretty much the best conductive insulation available and this is why they are so popular.

But wait, there is more. Remember that radiation heat transfer can also be affected by insulation. When a panel such as the skin of the coach gets hot, and there is no insulation in the way, the panel emits the heat into the cold space. If you have been in a coach with no insulation, so you can see the inside of the roof skin, on a sunny day you will remember the amount of heat being given off (radiated) by the inside surface of the roof. A lot of this radiation can transfer through transparent and semi transparent materials and some gets lost in these materials. If you reflect this radiant heat back to the skin you can cut down on the heat coming into the insulation. A technique called Radiant Shielding is used to reflect the radiant heat and prevent it from entering into the insulation where it would be conducted into the cool space (interior of the coach). In its basic application our reflective foil is placed a small distance below the roof decking The space below the foil is filled with fiberglass insulation. The space above and below the reflective insulation allows for the heat to reflect off the insulation and allows for heat to be directed away from the roof (in summer) or hold the heat (in winter) in the living area of the coach. Thus, the reflective insulation increases the existing value of the fiberglass insulation by holding in heat (in the winter) or reflecting heat from the interior (in the summer).

Because of the explanation above the characteristics of heat transfer (R-Values reflective insulation cannot be give an R-Value itself. It must be a calculated value based upon heat conditions at the time along with the existing value based upon heat conditions at the time along with the existing values of the type of insulation installed in the coach (i.e.: fiberglass,

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Foam, wool, etc.) to include values in materials such as ceiling panels, rubber or fiberglass exterior roof used. Calculating the R-value for our reflective insulation with these items in mind we can expect a value of R-38 with an exterior heat of 80 degree Fahrenheit using normal fiberglass insulation with an R-Value of R-12 in the roof. Remember this value will increase as the temperature increases. Radiant Technology reflective insulation reflects heat at a rate of 97%. The reflective insulation also acts a perfect vapor barrier. This will insure no moisture build up and holds in the existing insulation of the roof. This will eliminate any mold or mildew being created.

Benefits of the use of Radiant Technology reflective insulation include the extended life of the air conditioner, increased efficiency of the L.P furnace (far less use of L.P0 and an even comfort through the coach. The temperature should not vary more than 2 degrees from the floor to ceiling and wall to wall through the coach in any weather condition. A typical "Artic Pack) reflective insulation package used would include the following installation in the areas of: complete roof — front and rear wall areas of coach — complete under floor area (above exterior frame covering such as "Darko", galvanized metal or other covering) — slide out floors (under carpet) and under bed area in 5th wheel models. Some companies will also use the reflective insulation on the sidewalls of their coaches. Reflective insulation is not used in any lamination process for sidewalls, roof or floors for the reflective characteristics of the heat transfer will "melt" or loosen the glue used in the lamination process. That is why it must stay on the outside position facing away from the interior of the coach to reflect heat away from the interior (in the summer) and hold the heat in during the winter conditions.

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Installation Tips

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REFLECTIVE INSULATION INSTALLATION TIPS

These are two basic ways to install reflective insulation in an already existing home. One way is to staple the insulation to the underside of the roof trusses, taking care to also cover the end walls for complete coverage. (Generally this is only recommended for hot weather areas).

The second way is to lay it loosely on top of the attic "floor", which is normally made of ceiling joists with some sort of mass-type insulation (cellulose, fiberglass, etc.) laid in between.

- Tools needed: staple gun (if attaching to underside of trusses), measuring tape, scissors or utility knife, boards to walk on across rafters (in unfloored attics), broomstick, telescoping paint extension or other long pole to push insulation into eaves and other hard to reach areas.
- Begin by measuring the length needed of the four foot wide strips of reflective insulation. The should be placed cross-ways or perpendicular to the directions of the rafters and joists.
- Cut the needed number of strips on firm flooring, out in the yard, or use roll ease (contact office). Loosely roll the material back up and carry it to the attic for placement.
- Cut out a one square foot area over ceiling light fixtures to avoid het buildup under the reflective insulation.
- Overlap the strips of reflective insulation about 2 or 3 inches to completely cover your ceiling area.
- Do not place the reflective insulation over exposed wiring connections. All junctions should be in boxes. Have an electrician check your wiring if you are unsure about whether it has been installed correctly.

In Attics

Material should be placed on top of the existing insulation. (Use only perforated material to prevent moisture build-up)

Duct Work

For best results Radiant Technology material should cover duct work. When duct work is suspended it should be wrapped. Check all duct work to make sure all connections fit tight so the HVAC system, will work properly. If vents are separated, use aluminum tape (do not use duct tape) to seal together before covering with reflective insulation.

Mark anything that might be considered important with a fluorescent marker so the owner can find them after installation.

Be careful when trimming material. Watch for antennas, telephone wires and alarms. Sky light have to be wrapped (do not forget to include these when estimating material)

Safety Tips for Installing a Reflective Insulation System

- Work in the attic only when temperatures are reasonable. Attic daytime temperatures rise far above 100° during much of the year in the Sunbelt. Install your insulation early in the morning, or wait until cool weather sets in.
- Work with a partner. Not only does it make the job go faster, it also means that you will have aid should a problem occur.
- If yours is an unfinished attic, watch where you walk and use a movable support surface. Step only on the attic trusses or joists and your working surface. Never step on the attic insulation or the ceiling drywall below it.
- Step and stand only on the center of your moveable working surface. Don't step on the edge; it can cause the surface to tip.
- Watch your head. In most attics, roofing nails penetrate through the underside of the roof. If you bump your head, it can cause a serious cut or punctured. If your skin is punctured by a nail, and up to date tetanus vaccination is a must. Avoid potential problems by wearing a hard hat.
- Be especially careful around electrical wiring, particularly around junction boxes and older wiring. Never staple through or over electrical wiring.
- Make sure that the attic space is well ventilated and lighted. Bring in fans and extra work lights if necessary.
- If your attic has blown– in insulation, direct fans upward, away from the insulation material.
- Avoid exposure to fiberglass insulation. Wear long pants, along-sleeved shirt, and a particle mask or kerchief over your nose and mouth. Wear gloves if you are particularly sensitive to fiberglass.
- Wear a tool belt or utility apron to carry staples, staple gun, scissors, measuring tape, etc.
- Take frequent breaks and pace yourself. It's better to get the job done over a longer period than to risk an accident due to fatigue or to end up with a poor-quality installation.
- FINAL NOTE: Recent tests are now indicating a connection between direct exposure to fiberglass and lung cancer. To be safe, wear a face mask to avoid breathing fiberglass if you have it in your attic.

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Walk Through Inspection and Sign Off Sheet

1. Visual of Ceilings—Cracks, Water Leaks and Roof Leaks — Comment:

   _____

2. Visual of Walls—Water Leaks, Stains or Cracks — Comment:

   _____

3. Visual of Windows (Point out any cracked, chipped or broken glass) :

   _____

4. Visual of Duct Work in Attic, Crawl Space (Checking for broken, collapsed, damaged, disconnected trunk lines) Make Sure all are connected:

   _____

5. Visual of Air Circulation in Attic—Check for closed, obstructed or not proper ventilation– May need to recommend turbulator air management system.

   _____

   _____

Customer Recognizes items on Comment List

_____Customer

_____Dealer/Installer

Customer Acknowledges Installation was done correctly

_____Customer

_____Dealer/Installer

_____Date of Completion