

Silver Shield FAQ

Attic Radiant Barrier - Multi-Layer

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Why the shift to perforated Hi-Perm products?

As building envelopes are getting tighter, building scientists, energy centers and research organizations are suggesting that insulation products and facings used in hot humid climates have higher perm ratings for increased water vapor transmission. Fi-Foil's Hi-Perm versions are designed to meet or exceed these recommendations.

How does Silver Shield Radiant Barrier differ from other radiant barrier products, and what makes it the best?

All radiant barriers are effective. The difference is in the application or installation. The two most common are the deck applied and the truss mounted installation. They can be categorized economy and premium.

- The first installation applies the radiant barrier directly to the underside of the roof deck. This application does not allow for an air space between the roof deck and the radiant barrier. Also this application loses some of its effectiveness each time it comes in contact with one of the roof trusses. In addition, any nails that penetrate the roof deck reduce the product's effectiveness (shingles require a lot of nails or staples). This type of application would be considered an economy version.
- Silver Shield™ Radiant Barrier is installed to cover not only the roof decking but also the bottom of the top cord of the roof trusses. This leaves an airspace between the radiant barrier and the roof deck, which provides additional performance. In addition, the multi-layer design provides an additional layer of aluminum for maximum protection. Silver Shield™ Radiant Barrier is the best product installed using the best method of installation. It is a premium radiant barrier system.
- Remember, the larger the aluminum surface that is exposed to air, the better the performance of the radiant barrier system. The more wood and nails that are exposed, the greater the loss in performance.

Why should I install radiant barrier in unconditioned areas like the garage, patio and patio areas?

Heat radiates through the roof, and areas unprotected by the radiant barrier will allow heat to transfer to other areas of the house. Installing a radiant barrier in all areas of the house not only improves overall performance, but also increases comfort levels in unconditioned areas like garages and patios.

Does radiant barrier attic application require ventilation, and if so, what type (ridge, off-ridge, soffit, etc.)?

No, they work with or without ventilation but will perform better in ventilated attics. According to the building code, all attics in Florida must be vented.

Extended Version: Studies have shown that with or without a radiant barrier, a ventilated attic is best and the same holds true for a radiant barrier. A house will perform better with a radiant barrier and a ventilated attic than a house with a radiant barrier and a non-ventilated attic. Houses must be designed to meet the building code, which has ventilation requirements with or without a radiant barrier. In both cases, it is the ventilation rate that is important, not the method or type of ventilation.

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What is the R-value of a radiant barrier?

R-values relate more to mass type insulations or insulating materials that are installed in an enclosed air space. Radiant barriers are typically designed to work in vented attics, so their performance is not rated with an R-value; however, R-values are not the ONLY way to quantify resistance to heat flow. For example, a tree or an awning doesn't have an R-value, but it certainly can keep you cool. To simply put it, a radiant barrier is like putting a shade tree in your attic. Technically speaking, Silver Shield™ Radiant Barrier reflects 97% of the radiant heat and only emits 3% into the attic so unlike R-value, the lower the "E-value", or the less that it radiates into the attic, the better the radiant barrier. Silver Shield™ is the best-rated radiant barrier on the market.

Will a radiant barrier decrease the life of roofing shingles?

Various studies including those conducted by the Florida Solar Energy Center have concluded that it would be highly unlikely. In the Sunbelt and specifically Florida, shingles are exposed to roof temperatures of 160 to 190 degrees. Studies have proven that radiant barriers only increase roof temperatures by 2 - 5 degrees. A few degrees more won't make a difference.

What is the best attic radiant barrier application?

Deck-applied radiant barriers do not work as well as applying the radiant barrier to the bottom of the roof rafters, the way our Silver Shield™ Multi-layer Radiant Barrier is installed.

- Good: Deck-applied Radiant Barriers (1 airspace below the radiant barrier surface)
- Better: Draped over the rafters (2 airspaces: 1 airspace above and below the radiant barrier)
- Best: Attached to the bottom of the top cord of the roof truss or roof rafters (3 airspaces: one above, one below and one in-between the layers of the multi-layer radiant barrier. This application allows for the bottom of the roof rafter to be completely covered with foil.)

In summary, you want as much of the roof deck covered with low-emittance materials (foil) as possible. Deck-applied and draped radiant barriers sandwich the foil between the top cord and the roof deck. This area will continue to radiate as if there were no radiant barrier. The total area of roof rafters (as compared to the total underside of the roof surface) is as much as 35% - that's a lot. This means that 35% of the bottom of the roof surface is radiating at a high rate (82% to 90%) as opposed to the surface of the foil radiant barrier, which is only radiating at 3% to 5%. Covering the roof rafters with low-emittance radiant barrier improves the overall performance of the radiant barrier application. Fi-Foil recommends that you use the bottom of the roof rafter application, as well as the premium product, for this application - Silver Shield™ Radiant Barrier, which is a multi-layer radiant barrier.

Radiant barriers, just like many other products, have different levels of performance. However, the performance of these products is not only attributed to the product, but to the application, as well. If you are going to do the job, why not insist on the best application and the best product for the application?

Fi-Foil has products for all three applications.



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What is the best choice to upgrade energy efficiency, a radiant barrier or additional insulation?

To best increase your energy efficiency, you should deal with the problem at its source, the roof, and the best way to address it is by adding a radiant barrier. A radiant barrier is specifically designed for this application and will reduce heat transfer up to 97%. The radiant barrier will improve the performance of both the air conditioning ductwork and the mass insulation and will improve comfort in garages and patios, areas that are typically not conditioned. Studies have shown that the radiant barrier / mass insulation combination out-performs mass insulation alone. Silver Shield Radiant Barrier is installed just below the roof sheathing. The idea is to stop the heat right at the source, the roof, before it gets into the attic or building envelope. Standard mass insulation is almost always installed on the surface of the ceiling, and air conditioning duct systems are almost always installed in the attic space. So without a radiant barrier, the heat would build-up in the attic and reach extreme temperatures, upwards of 140 degrees. Think about it, does it make sense to pump 55-degree air through ducts running through a super-heated attic? And does it make sense to expose insulation to extreme temperatures when the R-value rating is determined at 75 degrees, with the knowledge that the R-value rating drops as the temperature increases? No, of course not! Why let the heat get in the attic in the first place? To summarize, adding a radiant barrier simply provides more benefits over adding more insulation (cooler attic, improvement in duct performance, improvement in ceiling insulation performance, more comfortable areas of the home that are typically not insulated like the garage and patio). If you have extra money in your energy budget, do both; however, the order is radiant barrier first, more ceiling insulation second.

Why do I need a radiant barrier and how does a radiant barrier work?

In a home without a radiant barrier at the roofline, your roof radiates solar-generated heat, which elevates attic temperatures upward to 150 degrees or higher. These higher temperatures will increase the heat gain in air conditioning ducts and reduce the performance of mass insulation (the R-values of mass insulation are determined at 75 degrees F - higher temperatures lower the R-value). In addition, the extreme temperatures will saturate the building materials in the attic. This stored heat acts as a heat sink and will continue to transfer heat into the living area of a home even after the sun has set, making the air conditioner run longer and consume more electricity. A radiant barrier stops 97% of radiant heat transfer, which improves the performance of insulating materials and lowers attic temperatures as much as 30 degrees F. A cooler attic will transfer less heat into your air conditioning ducts. Radiant barriers lower both cooling and heating costs, reducing energy expenditures throughout the year.

What is a radiant barrier?

A radiant barrier is a product that features a low emittance surface(s) (normally aluminum foil) that is designed to significantly reduce heat transfer between a very hot and high radiating surface (bottom of a roof deck) and a cooler highly absorbent surface (i.e. insulation on top of a ceiling). Multiple low emittance surfaces, even multiple layers with enclosed air spaces, can further reduce radiant heat transfer. Effective emittance is one term that can quantify the impact of the impact of the additional surfaces. In summary, the lower the emittance (radiation rate), the better the performance. Radiant barriers have been demonstrated to achieve significant energy savings in a wide variety of building types and in multiple climate zones.



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What can I do when I have a weak cell phone signal in my home which has a radiant barrier installed?

Purchase one of the following products to boost your cell phone signal:

- From Verizon Wireless - 3G Newtwork Extender (cost is approximately \$249.00).
- From AT&T Wireless - 3G MicroCell (cost is approximately \$200.00).

Please understand there can be a variety of reasons for a weak cell phone signal, and the products above were recommended by the two top cell phone service providers.

Is the calculated R-value based on the ASHRAE Fundamentals Handbook?

Yes. The ASHRAE Handbook values are a subset of data from the National Bureau of Standards (NBS).