

Radiant Barrier Insulation

What is Radiant Barrier Insulation?

Radiant barriers consist of a highly reflective, aluminum clad material that reflects (or more specifically-emits) radiant heat rather than absorbing it. However, it is important to note that radiant barriers do not reduce heat conduction as thermal insulation materials do. Radiant barrier insulation is a reflective insulation system that offers a permanent way to reduce energy costs.

Radiant barrier insulation, typically installed in the attic of a home, reduces both summer heat gain, as well as winter heat loss, lowering energy costs associated with heating and cooling.

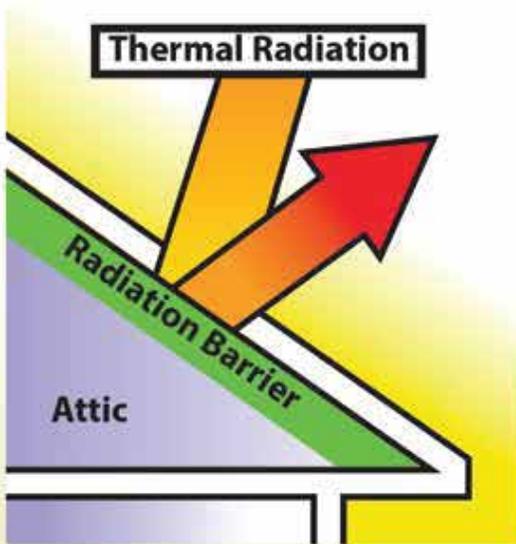
Summer heat and its effect on attic insulation

During the summer, radiant heat from the sun is absorbed by the roof of your home and is transferred to underlying roofing materials. On a typical summer day, when the outdoor temperature is 90 degrees, the temperature in your attic can rise to an astounding 140 degrees! When radiant heat permeates your attic, the confined space in your attic acts like an oven, super-heating air.

Most people are familiar with traditional insulating materials such as fiberglass and cellulose. The characteristics of these products, determined by their type and thickness, resist or “slow down” heat transfer. This resistance to heat transfer is also known as “R”-value.

However, when the temperature in your attic dramatically rises, two problems occur: First, the hot air penetrates the existing insulation. Second, the insulation traps in heat, similar to a sponge. The hot insulation becomes a secondary heat source, keeping your attic hot long after the sun has set. Heated insulation materials conduct heat through the floor of your attic to the ceiling of your living space. In fact, nearly 93% of heat that enters your living space during summer months is directly attributed to attic heat.

To combat this effect, most people turn on their air conditioner to keep their homes comfortable. This is an inefficient approach to attaining comfort and energy savings compared to installing a radiant barrier. When radiant barrier insulation is properly installed in your attic, it can block 97% of radiant heat. By lowering the temperature of your attic, you enjoy greater comfort in your home and lower energy bills.



How does a radiant barrier work?

Heat travels from a warm area to a cool area by a combination of conduction, convection, and radiation. Heat flows by conduction from a hotter location within a material or assembly to a colder location. Heat transfer by convection occurs when a liquid or gas is heated by a surface, becomes less dense, and rises (natural convection), or when a moving stream of air absorbs heat from a warmer surface (forced convection). Radiant heat travels in a straight line away from any surface and heats anything solid that absorbs the incident energy. Radiant heat transfer occurs because warmer surfaces emit more radiation than cooler surfaces. When the sun heats a roof, it's primarily the sun's radiant energy that makes the roof hot. A large portion of this heat travels by conduction through the roofing materials to the attic side of the roof. The hot roof material then radiates its gained heat energy onto the cooler attic surfaces, including the air ducts and the attic floor. A radiant barrier reduces the radiant heat transfer from the underside of the roof to the other surfaces in the attic.

A radiant barrier's performance is determined by two major factors:

- 1) **Emissivity** (or emittance) — is the ability of a surface to radiate or emit energy. It's expressed as a number between 0 and 1.
The lower the number, the better the radiant barrier performs.
- 2) **Reflectivity** (or reflectance) — is a measure of how much radiant heat is reflected by the material. It's also expressed as a number between 0 and 1 (sometimes, it's given as a percentage between 0 and 100%).
The higher the number, the better a radiant barrier performs.

Your Energy Solutions is proud to offer



Radiant Barrier Insulation Foil

Emissivity	0.03 (3%)
Reflectivity	0.97 (97%)
Weight	30.8lb/1000 sq ft
Thickness	0.0067 inches
Tensile Strength	257 lb/sq inch
Burst Strength	6.83 lb/sq inch
Water Vapor	0.005 g/sq meter/day
Temperature Range	-76F to 212F
Fire Rating	NPFA Class A / UBC Class 1



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