

Northwestern Ohio Foam Products, Inc.

Radiant Barrier Fact Sheet

Introduction

Radiant barriers made with aluminum foil facings are becoming a very popular way to save energy and money in structures. The use of a radiant barrier reflective insulation is not new; they are commonplace in many other everyday applications – but using them to enhance structural insulation values is becoming increasingly popular to save money, increase comfort, and reduce energy use on a broad scale.

What is radiant barrier?

Radiant barriers are materials that are installed in buildings to reduce summer heat gain and winter heat loss, and hence to reduce building heating and cooling energy usage. Radiant barriers usually consist of a thin sheet of highly reflective material, usually a high-purity aluminum, and are applied to a number of substrate materials. Some of the foil-faced products are fiber reinforced to increase the durability, ease of handling, and installation. Radiant barriers are used in residential, commercial, agricultural, and industrial buildings.

How do radiant barriers work?

Radiant barriers work by significantly reducing heat transfer from thermal radiation. All materials give off, or emit, energy by thermal radiation as a direct result of their temperature. The amount of energy emitted depends on the surface temperature and a property called “emissivity.” The emissivity is a number between zero (0) and one (1). The higher the emissivity, the greater the amount of emitted radiation or heat that an object gives off.

A closely related material property is the “reflectivity.” This is a measure of how much radiant heat is reflected by a material. The reflectivity is measured by a percentage reflected, and this number is between 0 and 100%. Hence, a material with high reflectivity has a low emissivity, and vice versa. **A radiant barrier MUST have a high reflectivity and low emissivity, and face an open airspace in order to perform properly.**

How does a radiant barrier differ from conventional insulation?

Both radiant barriers and conventional mass insulation try to perform a similar function in that they reduce the amount of heat that is transferred within a structure. They differ in the way they reduce this heat flow. Radiant energy is responsible for up to 90% of a structure’s heat gain during the summer months. Radiant barriers work by significantly reducing the amount of heat radiated across an airspace that is adjacent to the radiant barrier. A conventional insulation’s function is to trap air within the insulation – hence reducing heat transfer by air movement. Whereas a radiant barrier will virtually stop this radiant transfer, a conventional insulation will trap this radiant heat within itself. Energy exchange is always from hot towards cold – so the more trapped heat that is retained, the more of an opportunity for heat transfer to occur.