

SUPREME INDUSTRIES

Reflective Insulation

Transient heat is invisible and has no temperature, just energy. When this energy strikes another surface, it is absorbed and increases the temperature of that surface. In summer, radiation from the sun strikes the outer surfaces of walls and ceilings and is absorbed causing the surface to heat up.

Different types of insulation products reduce the heat transferred by conduction, convection and radiation to varying degrees. As a result, each provides different thermal performance and corresponding "R" values. The primary function of reflective insulation is to reduce radiant heat transfer across open spaces, which is a significant contributor to heat gain in summer and heat loss in winter.

Reflective insulation typically have "E" values of 0.03 (again, the lower the better). **Therefore, reflective insulation is superior to other types of insulating materials in reducing heat flow by radiation.**

When reflective insulation is installed in building cavities, it traps air (like other insulation materials) and therefore reduces heat flow by convection thus addressing all three modes of heat transfer.

In all cases, the reflective material must be adjacent to an air space. Aluminum, when sandwiched between two pieces of plywood or between two concrete layers for example, will conduct heat at a high rate. The conductive insulation material should always be in contact with the substrate for better insulation.

UNDERSTANDING A REFLECTIVE INSULATION SYSTEM (RIS)

A reflective insulation system is typically formed by layers of aluminum or a low emittance material and enclosed air spaces which in turn provide highly reflective or low emittance cavities (Air bubble film) adjacent to a heated region.

The performance of the system is determined by the emittance of the material(s), the lower the better, and the size of the enclosed air spaces. The smaller the air space, the less heat will transfer by convection. Therefore, to lessen heat flow by convection, a reflective insulation, with its multiple layers of aluminum and enclosed air space (INSUreflector), is positioned in a building cavity (stud wall, furred-out masonry wall, floor joist, ceiling joist, etc.) to divide the larger cavity (3/4" furring, 2" x 4", 2" x 6", etc.) into smaller air spaces. These smaller trapped air spaces reduce convective heat flow.

Reflective insulation differs from conventional mass insulation in the following:

1. Reflective insulation has very low emittance values "E-values" (typically 0.03 compared to 0.90 for most insulation) thus significantly reduces heat transfer by radiation



1. A reflective insulation does not have significant mass to absorb and retain heat
 1. Reflective insulation has lower moisture transfer and absorption rates, in most cases
 1. Reflective insulation traps air with layers of aluminum & Air bubble film plastic as opposed to mass insulation which uses fibers of glass, particles of foam, or ground up paper
 1. Reflective insulation does not irritate the skin, eyes, or throat and contain no substances which will out-gas
 2. The change in thermal performance due to compaction or moisture absorption, a common concern with mass insulation, is not an issue with reflective insulation.
- Supreme's Thermal Insulation Division offers solutions in the following areas:
- Ducting insulation in hospitals, shopping malls, airports, PEBs, IT/BPO etc.
 - Pipe insulation for split AC tubings, chiller piping, drain pipes, chilled water lines etc.
 - Floor insulation in server rooms, data centres, medical and diagnostic centres, and control rooms for petrochemicals.
 - Underdeck insulation in PEBs, textile units, malls, airports etc.
 - Overdeck and wall insulation in commercial buildings, residential buildings, cold storages etc.

'INSUreflector' offered by Supreme is made of polyethylene Air bubble film (ABF) laminated with aluminum foil on one or both sides.

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