

Reflective Insulation and Radiant Barriers and the Energy Crisis

As we enter another cycle of high-energy prices and diminishing resources, it suggests builders and owners take a renewed interest in ways to reduce the cost of heating, cooling and lighting their buildings. Each summer we are reminded of the limits of our national power systems as brown outs during peak hours on very hot days proliferate. The recent problems in California, brought on because of deregulation of the power companies, add to the energy crisis of that region. Regardless of one's political philosophy, it is clear to everyone that energy cost and supply problems are not going to disappear – to the contrary, the evidence shows they will be with us from now on.

Metal buildings present extra problems due to the high conductivity of the roof and outside walls. Temperatures on these surfaces can reach 140° F and higher. This problem is especially acute in the southern part of the US where summer temperatures often reach triple digits for days at a time. The energy consumption for cooling commercial buildings and homes drains the planet's reserve of its non-renewal fuel resources, putting added pressure on the economy and often exceeds the ability of the power grids to meet the demand.

The problem isn't confined to the southern part of the country or to summer conditions. Keeping heat in buildings during winter needs as much attention as keeping it out in summer. New sport complexes are a good example of buildings that use a tremendous amount of energy. (See fig. 1). Keeping the ice hard in a rink, providing adequate lighting and minimizing the detrimental effects of condensation through mechanical ventilation is a year round heavy drain on a local power grid.

Reflective insulation and radiant barriers reduce heat transfer that crosses air spaces, i.e. radiant heat waves, which often is the most significant cause of heat gain and loss in buildings – especially metal buildings. The use of a reflective insulation or radiant barrier is a very effective way to maximize a building's thermal efficiency. The facers of these materials are usually made of aluminum foil which has highly reflective / low emissive surfaces that reflect 95-97% of the radiant heat that strike them and won't emit more than 3-5% of the heat that is conducted through material. Left exposed in a building like the roof structure of an ice rink or a warehouse, a reflective insulation or radiant barrier is often the most cost effective way to achieve the greatest energy savings. In addition to effectively managing the heat transfer properties, the highly reflective surfaces reduce the lighting requirements by 30-40%. (See fig 2)

Reflective insulation and radiant barriers come in a variety of configurations, the most commonly used in the commercial metal building industry are the "bubble foil" products and other structures that incorporate polyethylene or polypropylene foams as the substrate with aluminum foil on one or both sides. The total structures are usually 5/16th inch or less thick. Their virtue lies in their ease of installation, (see fig 3 & 4), competitive prices, variety of sizes, and availability. Additionally, they are excellent vapor barriers and good remedies for condensation problems. Many building manufacturers and distributors offer reflective insulation with their building packages. Contractors who have used reflective insulation products continue to do so because of their customers' satisfaction.

Reflective insulation and radiant barriers meet Federal Trade Commission 460 guidelines and meet ASTM standards for testing and installation methods. Many manufacturers have reflective materials that have ICBO, BOCA, and SBCCI code body approvals. Marketers and manufacturers are members of RIMA, the Reflective Insulation Manufacturers Association, working to educate and assist contractors in the use of reflective products. If reflectives are new to you, plan to try them out this year. That way, you will be doing your part to reduce energy consumption in your community, create a new profit center for your business and gain more satisfied customers.

Robert Wadsworth is President of ASTRO-FOIL® Innovative Energy, Inc., past President of RIMA and has been marketing reflective insulation products for over 20 years.