GSA'S NEW ITEM INTRODUCTORY SCHEDULE—A VALUABLE RESOURCE FOR GOVERNMENT ENERGY MANAGERS

The Federal Supply Service of the General Services Administration publishes a New Item Introductory Schedule (NIIS) which offers Federal customers the latest in product technology. This can be a valuable resource for Federal energy managers who are looking for products that will reduce their facility energy expenditures. The NIIS lists current contracts under particular supply classifications. The listing for each contract shows the:

- Special item number,
- Item name with description,
- Contract number,
- Contractor’s address and telephone number, and
- Effective date of the contract.

The contractors listed in the NIIS will provide Government customers with detailed brochures about their products upon request. The brochures show:

- Prices and discounts,
- Ordering and payment addresses,
- Delivery terms,
- Maximum order limitations,
- Business size,
- Country of origin,
- Models offered,
- Contract number,
- Period of coverage, and
- Miscellaneous marketing information.

The current NIIS contains the following products of interest to energy managers:

- One-way/two-way light sensors,
- Corridor/warehouse light sensors,
- Fluorescent automatic/manual dimming controls,
- Passive infrared occupancy sensors,
- Lighting adapters and reflector accessories,
- Programmable thermostats,
- Spray-on low-emissivity coating,
- Energy management systems,
- Air-to-air heat exchangers, and
- Air conditioner accumulator chargers.

The GSA Federal Supply Service also publishes a bimonthly newsletter entitled Markettips to update Government customers on the latest news in product development, performance, and availability.

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FEDERAL ENERGY EFFICIENCY AWARDS

This fall, during Energy Awareness Month, the Federal Interagency Energy Policy Committee and the Department of Energy will present the Federal Energy Efficiency Awards which recognize outstanding achievements in the reduction of energy consumption within the Federal Government. The ceremony will be held in the Caucus Room of the Russell Senate Office Building on October 27, 1989. The awardees will be honored for their accomplishments in energy conservation during FY 1988. Award winners are recognized for a wide range of conservation initiatives which include:

- Improved performance, through increased efficiency and reduced consumption of energy;
- New concepts, devices, equipment, or procedures, which have been proven in practice;
- Effective training programs for energy managers, operators, or maintenance personnel;
- Employee energy awareness programs which contributed to the conservation of energy.

Seventy-one nominations were received and have been reviewed and evaluated. Fifteen individuals, fifteen organizations, and one special awardee were selected.

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RADIANT BARRIERS — 
OPTIONS TO REDUCE HEAT TRANSFER AND SUMMER HEAT BUILDUP IN 
SOUTHERN CLIMATES

An explanation of radiant barrier systems requires an understanding of heat transfer. Heat moves from a warm area to a cool one by means of conduction, convection, and radiation. Heat is conducted from hot to cold locations by traveling through a solid from molecule to molecule; it flows from a hotter material to a colder material when in direct physical contact. Heat is transferred by natural convection when a liquid or gas is heated, becomes less dense, and is pushed upward by the gravitational displacement of heavier fluid. Radiation, or radiant energy, travels outward in a straight line in all directions as waves. It does not need the presence of matter, and can operate in a perfect vacuum. It needs only two objects of differing temperatures that are in direct view of each other. The heat from a hot wood stove 10 feet away, for example, radiates heat toward you.

In the case of a typical residential building, when the summer sun heats a roof, that heat conducts through to the underside of the roof, and then radiates down to the top of the attic insulation. The insulation retards the flow of heat, but eventually the heat conducts through the insulation into the room below. Researchers have found that installing a radiant barrier in the attic airspace blocks the passage of radiant heat from the roof to the insulation, reducing the amount of heat entering the house.

How Radiant Barrier Systems Work

Radiant barriers reduce radiant heat transfer. They reflect a large portion of the roof’s radiation back to the roof, and transfer very little thermal energy to the house’s interior. To be effective, a radiant barrier must be installed facing an air space. It need not form an airtight seal. Radiation, unlike hot air, travels in a straight line and does not seek a hole for escape.

In an attic, an aluminum foil radiant barrier that faces an air space blocks 95 percent of the heat radiating down from the hot, sun-heated roof.

Although regular insulation can be assigned an R-value, a measure of the material’s resistance to heat flow, attempts to assign an “apparent,” “effective,” or “equivalent” R-value to radiant barrier systems are not productive, because the results are highly dependent on the test conditions. Many factors affect the thermal performance of radiant barrier systems, including whether the air space is vented or not, the rate of air flow in the vented space, the temperature difference, and the amount of regular insulation over which the radiant barrier is installed. The cost-effectiveness of installing a radiant barrier system, then, will depend on a number of factors. Performance and the savings that will result should be carefully calculated. Savings should then be compared not only with the total installation cost, but also with the cost of undertaking alternative measures, such as installing regular insulation, that will produce equivalent savings.

Product Types and Costs

A growing number of manufacturers are producing products labeled as radiant barriers. In addition, certain common building products can be used as radiant barriers. Many rigid insulation and laminated structural sheathing materials have an aluminum surface that serves as a radiant barrier when installed facing an air space. Costs for these rigid insulation materials range from $0.25 to $0.35 per square foot. Laminated structural sheathing materials sell for $0.13 to $0.25 per square foot. Another type of product known as “builders foil” consists of a thin foil layer, either single-sided or double-sided, perforated or unperforated, and laminated to a reinforcing substrate. The unperforated types also function as excellent vapor retarders. Costs range from as low as $0.03 to as high as $0.75 per square foot.

The foil and the substrate are important factors in selecting a suitable product. The foil and substrate should not tear easily. Many foil-faced fiberglass insulation batts have a highly-flammable bituminous adhesive that attaches the foil to the insulation. The foil facings of these products are clearly marked. They should not be used as radiant barriers because of the potential fire hazard.

Multi-layer Reflective Insulation

Certain commercial multi-layer foil materials are formed to enclose air spaces, producing a reflective insulation product. Some products resemble an accordion. Others resemble bubble packaging material. These products are light-weight, compact, and easy to handle and store. They typically sell for between $0.14 to $0.70 per square foot. Since they have one or more reflective surfaces facing an air space, they block radiant energy.

The enclosed air spaces reduce convective and conductive heat transfer. Consequently, an R-value may be assigned to these reflective insulation products.

Radiant Barrier Coating

Another option is a radiant barrier coating that can be sprayed on like paint to both reflect heat (infrared radiation) and light. A product recently tested by the Florida Solar Energy Center achieved emissivity of about .22, thus blocking 78 percent of the radiant heat. It tolerates high temperature regimes including tempera-

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Research Results of Radiant Barrier Systems

Key performance data on radiant barrier systems are based on research conducted at the Florida Solar Energy Center, Oak Ridge National Laboratory and the Tennessee Valley Authority. Tests in both controlled laboratory facilities and specific Federal facilities (Fort Benning, Georgia) have shown that radiant barriers can be cost effective in hot climates (over 2,000 annual cooling degree days) to reduce air conditioning load in residential structures. Depending on the cost and application (retrofit vs. new construction), radiant barriers may also be effective in smaller commercial buildings and warehouses. Any specific application should include a site-specific life cycle cost analysis based on calculated annual energy cost savings. For further information on radiant barriers contact:

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