The Use of
Interior Radiation Control Coatings
and
Radiant Barriers
in Building Construction
& Energy Conservation

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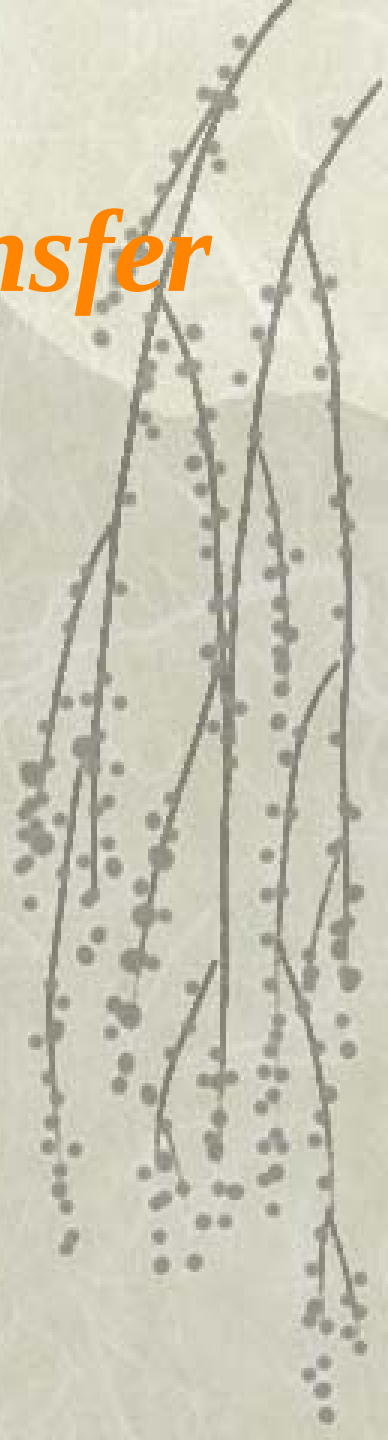
The 3 Methods of Heat Transfer

- **Convection**
- **Conduction**
- **Radiation**



Convection

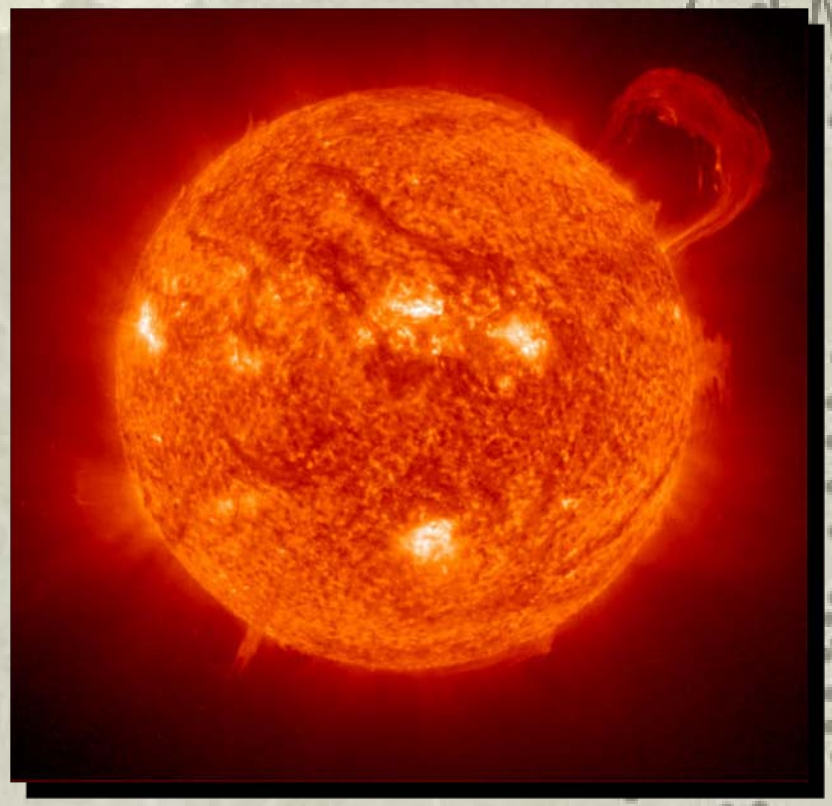
- **Heat transfer in a gas or liquid by the circulation of currents from one region to another**

Conduction

- **Heat transfer between neighboring molecules in a substance due to a temperature gradient**
- **Always travels from a warmer region to a cooler region and acts to equalize the temperature difference**

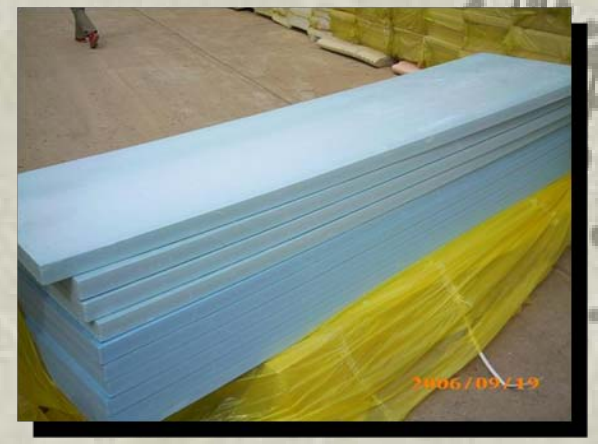
Radiation

- **Electromagnetic radiation emitted from the surface of an object due to the object's temperature**
- **Always travels from hotter surface to cooler surface to equalize temperature difference**



Heat Transfer in Homes & Buildings

- **Standard building insulations are designed to reduce heat gain by convection & conduction**
- **They are much less efficient at controlling radiation heat gain**



How Radiation Heat Transfer Affects Building Temperatures

- 90+% radiant heat gain comes through the roof
- Sun's radiation warms the roof deck
- This heat is conducted through the sheathing
- Sheathing tries to radiate to cooler area
- Attic cavity begins to warm and heat attic insulation

How Radiation Heat Transfer Affects Building Temperatures

- **Insulation absorbs and stores that heat, allowing it to warm the rooms below the attic long after sunset**
- **This forces A/C units to work long through the night to dissipate that stored heat energy**

Emissivity

- **Emi - Whatty??????**

- **Emissivity is the ratio of energy radiated by a particular material to energy radiated by a perfect black body**
- **On a scale from 0 to 1**
- **It is a measure of the material's ability to radiate or emit absorbed energy**

A Perfect Black Body

- A material that has an emissivity of 1
- It radiates or emits all of its absorbed energy
- The closer a material's emissivity is to 0, the less it can transfer its energy by radiation

Low Emittance Under the Roof

- **Most decking materials have high emissivities (.8+)**
- **Placing materials with Low emissivities under the roof reduces the roofs ability to radiate its stored heat energy into the attic cavity**
- **Delta T (Δ T)**
- **Don’t forget an airspace!**
- **Ventilation is critical**

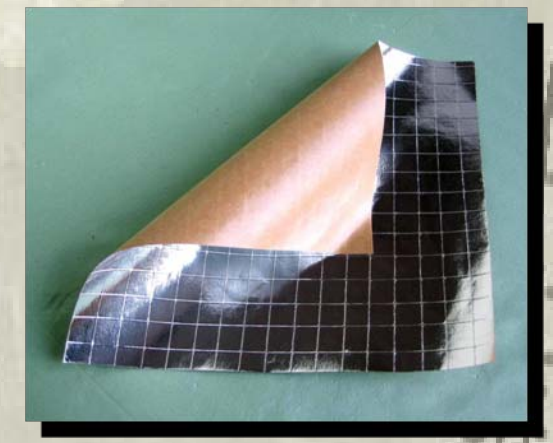
Radiant Heat Gain

vs

Low Emittance

Interior Radiation Control Coatings and Radiant Barriers

- **Interior Radiation Control Coatings - IRCCS**
- **Reflective Insulation**
- **Radiant Barrier**
  - **Foil faced foam**
  - **Foil faced scrim**



- **Ease/Cost of installation**
- **New Construction vs. Retrofits**

Other Uses for IRCCS & Radiant Barrier Coatings

Excellent technology at blocking radiant heat transfer on a wide variety of substrates

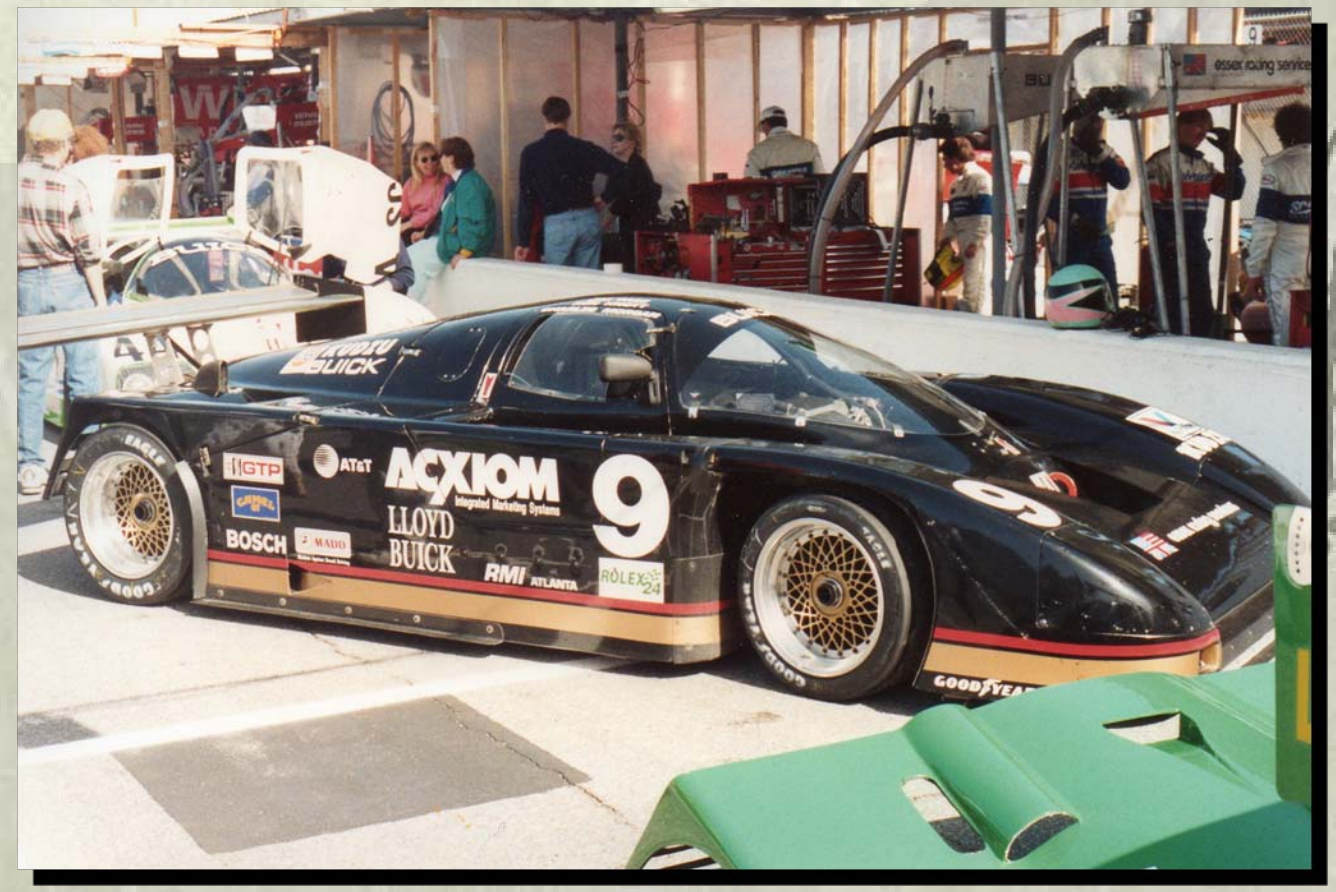
AURA Gemini Observatory, Mauna Kea, HI

Montreal Canadiens' Practice Facility, Montreal Canada

Rooftop Applications

Sidewalls of Uninsulated Metal Structures

Automotive Applications



Manufacturing Applications

Industrial Applications & More

Recognized Energy Saving Technologies by the Following:

- ASTM
- ASHRAE
- AIA
- Florida State Energy Code
- Austin Energy
- Florida Solar Energy Center
- Electric Power Research Institute
- Environmental Protection Agency
- Florida Power & Light
- Oak Ridge National Laboratory
- Lawrence-Berkeley National Laboratory
- Insulation Contractors Association of America
- NASA
- Jet Propulsion Laboratory

Trade Association - RIMA

- **Reflective Insulation Manufacturers' Association**
- **Technical articles and independent 3rd party reports and testing**

- **www.rima.net**

IRCCS & Radiant Barriers Will Help You:

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