



**CATI**

Center for Advanced Technology and Innovation

## Thermal Panel for Passive Temperature Control

**Passive Temperature Controls:** With the ever increasing costs of fuel and electricity, finding efficient ways to control heating and cooling of structures is becoming increasingly important. One method of decreasing heating and cooling costs is through the use of passive temperature controls. Passive temperature controls involve the absorption and reflection of solar light to regulate the temperature of a building. By having a dark colored roof, thermal energy is absorbed, thus increasing the building's temperature. By having a white colored roof, heat producing light is reflected, thus decreasing the building's temperature. This device is capable of showing a dark colored roof until optimal temperature is reached, then changing to a light color to reflect the sunlight or, having a light colored roof until a low optimal temperature is reached, then changing to a dark color to absorb light.

### **Patent Technology:**

1. US Patent No. 6,564,796, Issued 05/20/03, "Thermal panel for passive temperature control"

**Technology Benefits:** It is well known that it is possible to control a building temperature through the use of either a dark roof color to absorb light, thus heating a structure, or through the use of a light roof, thus reflecting light and cooling a building. However, no such roofing system has the capability of both heating and cooling. This invention consists of a thermal panel including a cell having a transparent side and a base side. The cell contains a heatable plate which has both a heating and cooling position. The plate is exposed when in the heating position and covered by an insulating medium when in the cooling position. This allows for both heating and cooling features. The dual role of this thermal panel allows for the absorption of light waves until a maximum threshold temperature has been reached. At this point, the insulating medium will cover the heatable plate, thus reflecting the light waves and no longer heating the structure. Conversely, the panel will reflect light until a minimum threshold temperature is met; at this point the

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insulating medium will retract and allow for the absorption of light waves to increase heat in the structure.

**Possible Applications for the Thermal Panel:** The thermal panel can be used in a wide variety of roofing applications. Homes, businesses, farms, and warehouses, are all possible facilities that can benefit from this thermal panel roofing. The ability to absorb or reflect lighting makes this product ideal for any structure looking to increase heating and cooling efficiency while lowering their costs.

**Passive Temperature Control Market:** According to the EPA Energy Star program, Americans spend \$40 billion dollars annually to air condition buildings. This equates to one sixth of all the energy generated in the United States. EPA estimates for strategic energy management say that businesses can spend half of their normal heating and cooling fees and that home owners can save one third on their energy bill. Americans in 2004 saved enough energy to power 24 million homes, reduced greenhouse emissions equivalent to 20 million cars and saved \$10 billion through the use of energy saving products. In the United States there are 66 million residential buildings, 5 million commercial buildings and 2.5 million farms and manufacturing facilities, many of which have multiple buildings. With such a large market in terms of numbers, the market size in terms of financial gains and energy savings is enormous. According to American Solar, Inc. a leading producer of solar heating systems, if just a fraction of these facilities were to utilize more energy efficient roofing, it would go a long way in reducing the nation's dependence on fossil fuels and electricity.

### **Licensing Opportunity:**

The Center for Advanced Technology & Innovation (CATI) is a technology transfer and commercialization center located in Southeast Wisconsin. CATI has acquired the above technology from The Boeing Company and is making it available for review and licensing.

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