National Aeronautics and Space Administration

Heat Reflection Technology

MSFC Thermal Management Coating

technology opportunity

NASA's Marshall Space Flight Center (MSFC) has developed a new thermal management coating technology that will perform as a heat protection system against excessive heat situations—situations that may destroy or damage valuable assets. The Heat Reflective Technology incorporates a resinous binder with microscopic particles that absorb the heat, only to discharge it at a later time. The properties of this technology allow it to respond in a continuous time frame and can be adapted to any given heat situation. This technology shows great potential as a heat protection application, while efficiently operating in an environmentally friendly manner.

Benefits:

- Easy application, lightweight
- Absorbs exponential amounts of heat at lower ranges <100° F
- Long-term durability, unaffected by UV rays
- No residue or side effects
- Non-ablative
- Temperature requirements adjustable to a specific application
- Can be pigmented to any desired color
- Environmentally friendly
- Will not affect telemetry or communications performance
- Low dielectrics

The Technology

NASA's Thermal Management Coating technology, patent number 6,939,610, utilizes solid-liquid phase change materials to aid in absorption of heat that is generated. This technology has flown on the International Space Station for over four years with constant exposure to atomic oxygen and UV rays with less than a one percent degradation.

Commercial Applications

- Fire Protection Systems
- Residential & Commercial Paints
- Camping Equipment
- Air Conditioning, Temperature Management Systems
- Military/Aerospace
- Automotive

The composition of this coating includes a resinous binder containing a quantity of microspheres–microscopic particles in the form of a solid phase change material encapsulated in an inert shell. These microspheres will absorb large amounts of heat that can be stored up and released at a lower temperature. The binder can be loaded with varying amounts of microspheres dependent upon its intended application. This technology has been successfully tested in the 100° to 900° F ranges.

Potential applications may include commercial and residential paints, aerospace materials, textile/clothing manufacturing, military applications, etc.

Opportunity

This patented technology is part of NASA's Technology Transfer Program, which seeks to stimulate commercial use of NASA-developed technology. Companies are invited to license the technology to create a commercial product from it. NASA is flexible in its agreements, and opportunities exist for exclusive, nonexclusive, or exclusive field-of-use patent licensing.

For More Information

If you would like more information about this technology or about NASA's technology transfer program, please contact:

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