Materials and Coatings

MSFC Thermal Management Coating

NASA's Marshall Space Flight Center 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 it can be adapted to any given heat situation. This technology shows great potential as a heat protective coating, while efficiently operating in an environmentally friendly manner.

BENEFITS

- Easily applied, lightweight
- Absorbent exponential amounts of heat at lower ranges <100° F
- Long-term durability, unaffected by UV rays
- Residue-free
- Non-ablative
- Temperature-adjustable to a specific application
- Can be pigmented to any desired color
- Environmentally friendly
- Non-intertening will not affect telemetry or communications performance
- Low dielectric

technology solution

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.

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 micro-spheres 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.

APPLICATIONS

The technology has several potential applications:

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

PUBLICATIONS

U.S. Patent No. 6,939,610

More Information

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NASA's Technology Transfer Program pursues the widest possible applications of agency technology to benefit US citizens. Through partnerships and licensing agreements with industry, the program ensures that NASA's investments in pioneering research find secondary uses that benefit the economy, create jobs, and improve quality of life.

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