NanoTech: Technology Overview

Technology Overview

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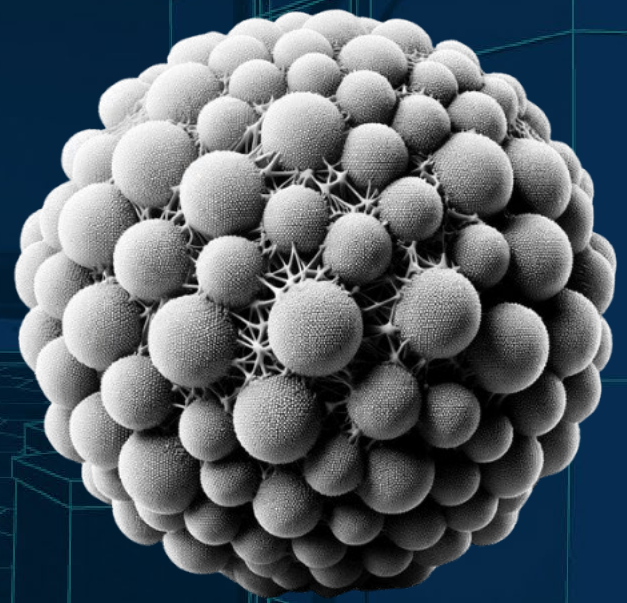
Videos

Videos


Fireproofing AND Insulation in One Technology
thenanoshield.com

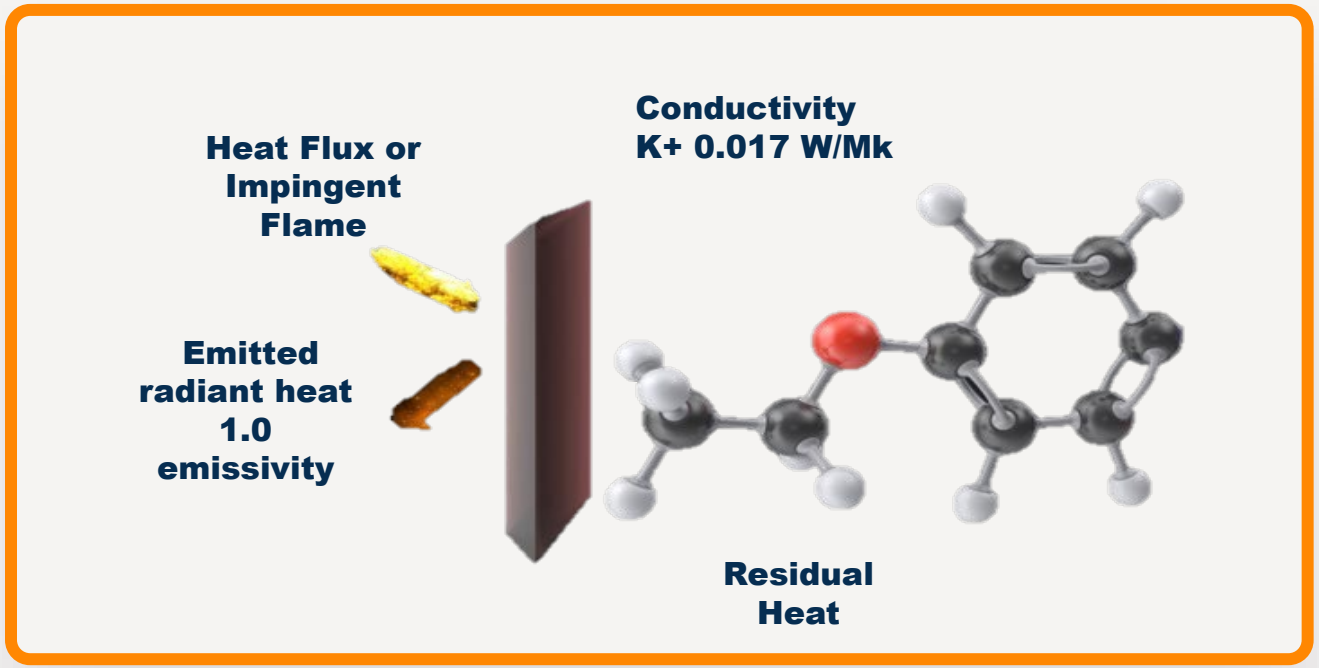
The Technology

NanoTech Materials, Inc. has patented a new additive used in heat control by integrating its novel **Insulative Ceramic Particle (ICP)™** into common building materials, coatings, and substrates, giving them **low thermal conductivity and/or high emissivity in formulations with a wide range of tailoring properties.**



THE SCIENCE BEHIND OUR ICP™

- Our Insulative Ceramic Particle (ICP)™ can be embedded into common building materials, coatings, and substrates, giving them low thermal conductivity and/or heat conservation, rejection, or containment properties.
- Technology based on the energy band theory. Departs from low mass technologies (aerogels) or reactive chemistry (intumescent) allowing material properties or coating formulations not possible until now.
- Safe and non-toxic additive enables water based, low VOC, and versatile mechanical property materials.



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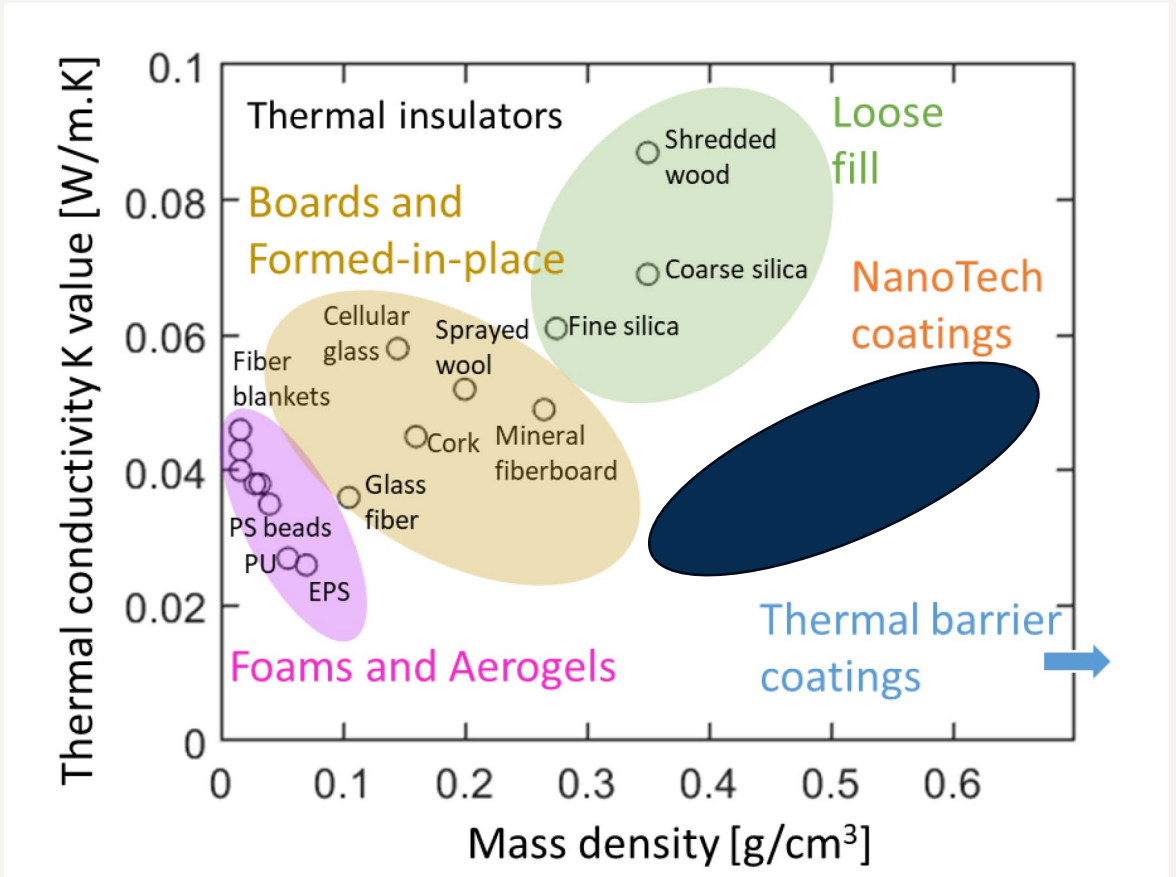
THE SCIENCE BEHIND OUR ICP™

- The graph shows thermal conductivity as a function of mass density.
- This technology enables coatings and development of materials that do not depend on lack of mass or reactive chemistry for heat management.
- This opens a wide area of product development in durable coatings and materials that need superior mechanical properties with high performance in thermal management.



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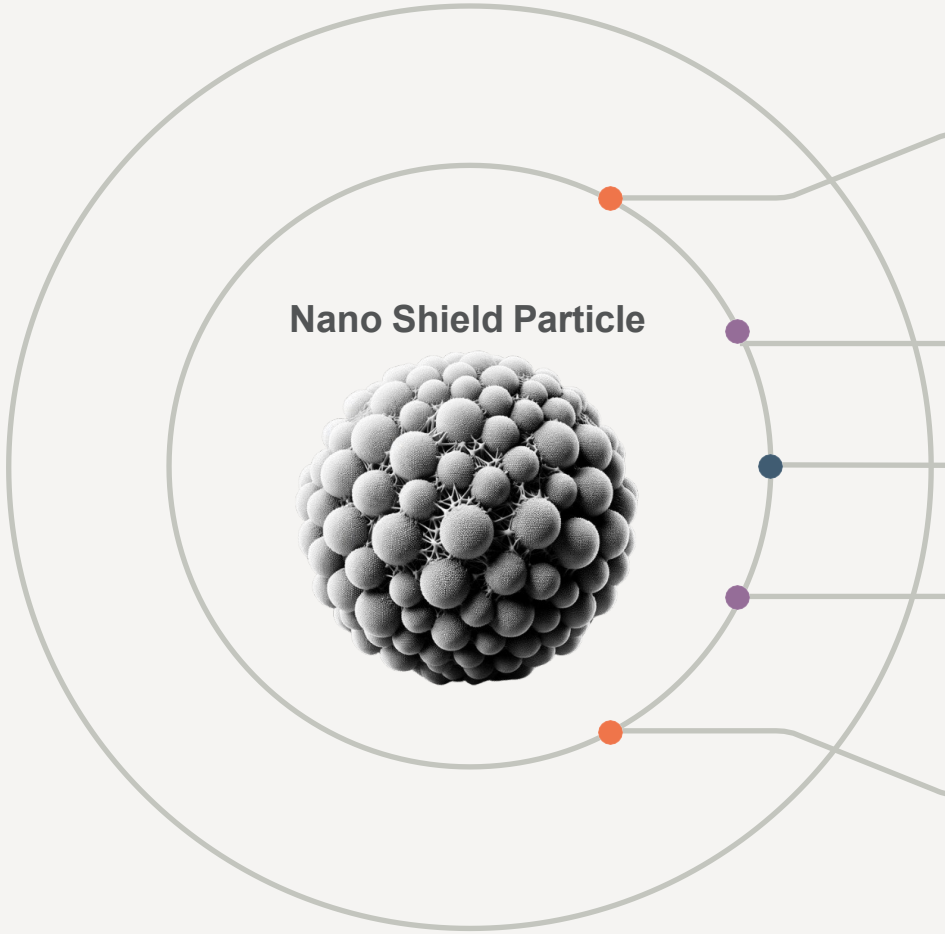
Commercially Available Products



Fireproofing

1,800°C fireproofing

Cool Roof Coating

Reduce energy costs & carbon footprint

Insulation

Low thermal conductivity with durable coatings for rugged and extreme insulation

Particle

Adaptable to paints, polymers, cement, resins, and more…

Ceramic

Next generation refractory material

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Examples and Uses of the Technology

Fireproofing

- Fire barriers made of combustible materials
- Fire protection of lithium-ion battery transportation

Thermal Insulation

- Thermal comfort of portable structures and heat signal reduction
- Improve heat containment for energy efficiency

Refractory

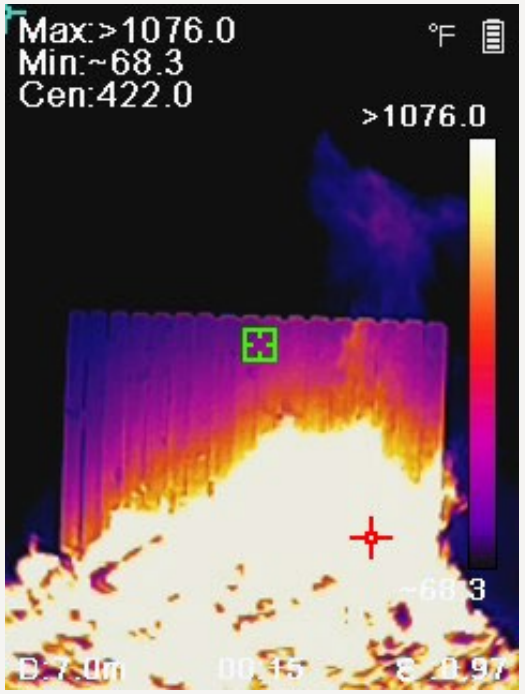
- Low thermal conductive ceramic coating for extreme heat containment

Bespoke solutions

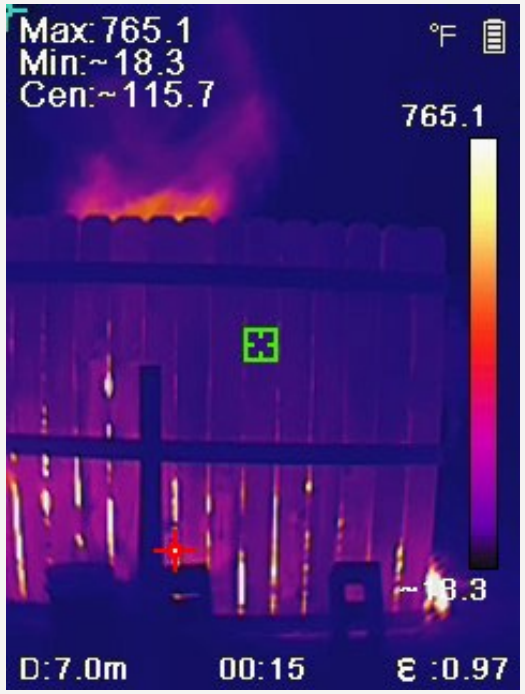
- Product and formulation development for new materials that require thermal management

Examples: Fire and Heat Flux Protective Barriers

Fireproofing formulation applied to a wood fence. Thermal imaging demonstrates heat restraining properties. Images taken at the peak of the fire. Katy TX fire department supervised project.



Front of the Fence View



Back of the Fence View

Lateral View

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Examples: Thermal Insulation of Portable Structures

Thermal insulation coating applied to a container office.

- 20 ft container
- Roof and Sides coated
- Pre-coating temperature readings:
  - Roof – 159.1 F/70.5 C
  - Internal Ceiling – 141.98 F/61.1 C
- **Post-coating temperature readings:**
  - **Roof – 129.38 F/53.8 C**
  - **Internal Ceiling – 105.8 F/41 C**
  - **Internal Room Temp w/o AC – 93.2 F/34 C**
- **Coating reduced HVAC energy consumption by 70%**

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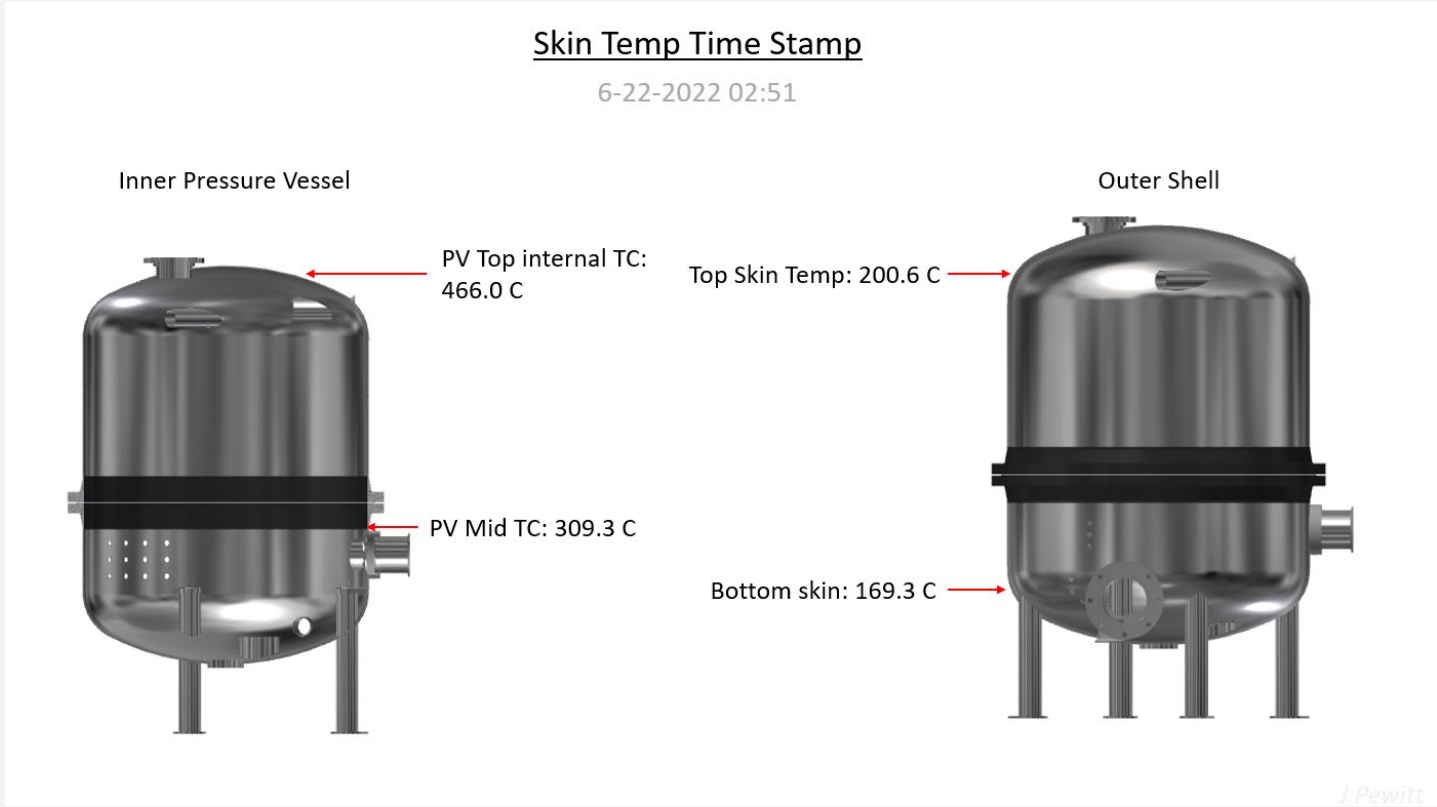
Examples: Low Thermal Conductivity Ceramic Coating in a Refractory Application.

Cold cure ceramic coating applied at 5 mm to reduce heat transfer to the body of this high temperature burner to prevent outer shell damage and improve energy consumption and efficiency. Internal operational temperatures more than 900C.

This same product is currently being tested at the launch site of Space X as a protective layer for launch pad areas.

Note: before and after temperatures shown at steady state conditions.



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