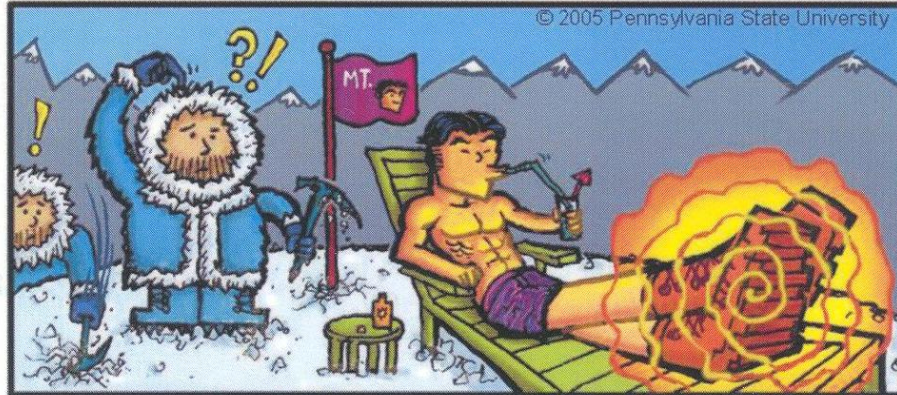


What is the product?

Toasty Feet Insoles



What is it used for?

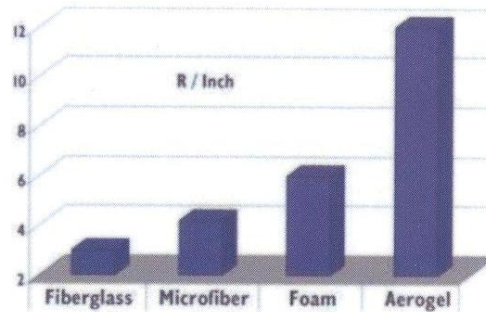
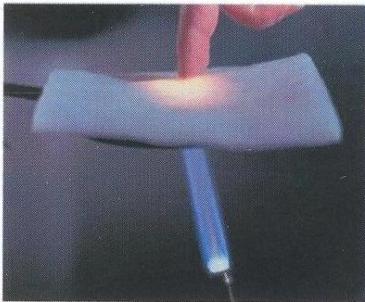
These shoe inserts retain warmth in cold conditions and insulate from heat in hot conditions.

What is “Nano” about it?

- “Aerogel” is a silicon (Si) based solid that is 99.8% air and 1000 times less dense than glass.
- This technology uses “pyrogel” a material similar to aerogel which has a large surface area caused by the presence of pores of around 10nm in diameter.
- The insulating properties of the aerogel based fabric or “pyrogel” can protect against extreme temperatures using a limited thickness of material.
- A block of aerogel as large as a human weighs less than 1 pound but can support 1000 pounds.

How does it work?

- The aerogel material is very porous and has a very large surface area. These pores trap air and give the material excellent insulating properties. The trapped air stops the conduction of heat to and from your body.
- The inserts offer lightweight support for your feet and are rated to be twice as effective as other more traditional insulators of the same thickness.
- The chart that follows shows the R-factor* rating per inch of aerogel compared to these other materials.
- An inch of aerogel is more than 4 times more efficient as an inch of fiberglass and 2 times better than foam (which doesn’t have nano-sized pores) as an insulator.
- Pyrogel AR5401 is used for the shoe insoles. Pyrogel AR5401 is aerogel that is infused with carbon. The carbon helps to absorb odor.



Courtesy of Aspen Aerogel

Does it have other applications?

Yes.

- Jackets and gloves can be made thinner but still keep you as warm in the winter.
- NASA uses this technology to keep astronauts safe in harsh conditions in outer space.
- Planes can use aerogel as an insulating material to lower the overall weight and increase fuel efficiency.
- Due to its heat insulating properties, this material can be used for fire protective clothing.

What is the price?

The price is around \$13.00 for a pair of insoles.

This information was obtained from:

The Jet Propulsion Laboratory at the California Institute for Technology
Aspen Aerogels Inc.