

# far-infrared

## The three principles of warmth

**W**hy do clothing and sleep products with **Nikken Far-Infrared Technology** keep us comfortable in summer as well as winter? The reason is because, in Nikken products, far-infrared uses a careful balance of the three mechanisms that keep us warm—or cool. These three elements are *reflection, insulation, and breathability*.

### Reflection—

—is where Far-Infrared Technology reveals how differently it works, compared to the heat-retaining properties of ordinary covers or garments. Those keep us warm by merely trapping body heat close to the skin. But Nikken products containing ceramic-reflective fibers absorb energy from a variety of sources—the body wearing them, ambient heat (that is, the heat in a room or outdoors), or heat rays, such as sunlight.

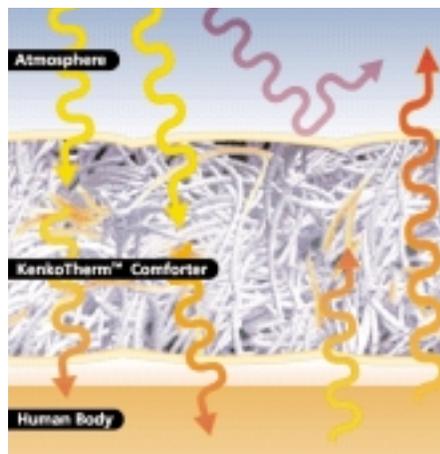
An important characteristic of ceramic-reflective fibers is that they are exceptionally capable of reflecting this heat. Once they absorb it, they bounce it back.

First, each fiber absorbs as much heat as it can hold, the way a sponge absorbs water. Then, just the same as a saturated sponge will allow excess water to ooze out, the heat contained in ceramic-reflective fibers begins to seep out. And although the fibers absorb different types of energy from many sources, they reflect it back *only* in far-infrared wavelengths—at a slow, controlled rate, as gentle heat.

A wet sponge left on a kitchen counter will slowly release its moisture into the atmosphere as evaporation. That's why it takes some time for a sponge to dry out

completely. In the same way, Far-Infrared Technology releases heat in a controlled, gradual fashion—keeping you comfortable for an entire day or night, returning the energy it is continually absorbing.

This is the principle of reflection, and Nikken Far-Infrared Technology has



refined this mechanism to capture heat and to reflect it in a way that gives you maximum temperature comfort.

### Insulation—

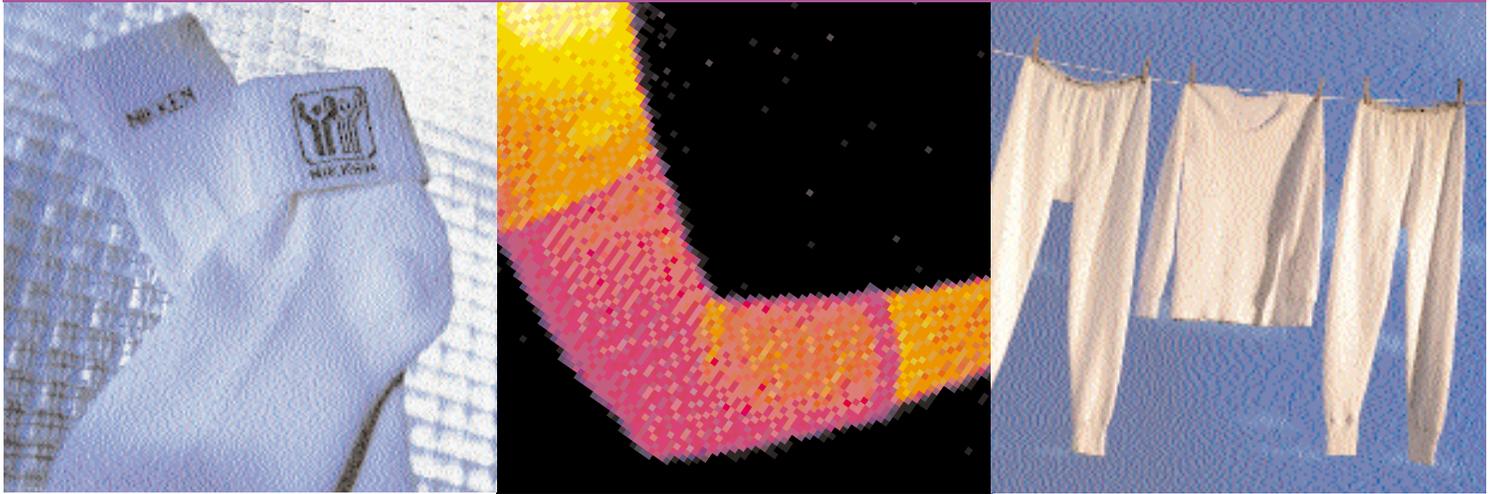
—is the second principle used in far-infrared products. We're all familiar with

how this works. Insulation puts a layer of air, or material that contains air, between two different temperatures, to slow down (inhibit) temperature transfer. Insulation keeps us warm in cold weather—our houses are lined with insulating material to prevent heat from escaping. Insulation also keeps things cool in hot weather. A Styrofoam ice chest is a good example. Styrofoam is a material that contains a lot of trapped air; that's why even a thick Styrofoam container is so light in weight. When you put food and beverages on ice inside a cooler, the layer of trapped air is what keeps the contents cold, even on hot days.

Nikken products with Far-Infrared Technology include insulation in varying degrees, depending on the function and the season for which the product is designed. For example, the KenkoTherm Winter Comforter has more insulation than the summer version, to provide more of a barrier against colder external temperatures.

### Breathability—

—works with the reflective and insulating properties of Far-Infrared Technology. As explained above, the ceramic-reflective



fibers in far-infrared material slowly release the heat they have absorbed. When this heat is being released, it can go in two directions, inward (toward you) or outward (away from you, to the outside of the garment or covering). The outer layer of the covering determines how much heat can escape outward. (Try wearing a plastic bag sometime, and you'll notice that plastic lets almost no heat out; you'll begin perspiring right away.)

Nikken comforters have an outer cover that is precisely calibrated for the right amount of breathability, to let out excess heat. This breathability is what helps make them comfortable in warm weather. When the ceramic-reflective fibers have absorbed heat and begin radiating it, the excess heat is released through the breathable outer cover.

Nikken Far-Infrared comforters and garments are also self-regulating. Some parts of your body get warmer than others. The ceramic-reflective fibers near these "hot spots" quickly reach their saturation point, and will retain no more heat. So this excess heat is released, and the breathable cover expends it into the surrounding air. When you're using a KenkoTherm comforter with a Nikken Sleep System, this effect is assisted by the innovative construction of the Sleep System itself. Its breathable foam layers are engineered to also aid in ventilation.

Nikken ThermoWear socks work the same way. When your feet are cold, the ceramic-reflective fibers do their work, returning warmth. But the socks' breathable fabric allows excess heat to escape and perspiration to evaporate.

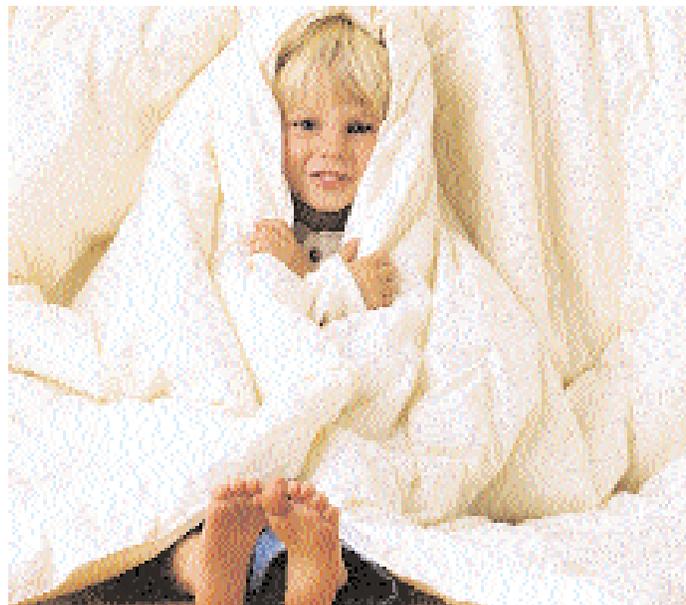
## Far-Infrared *for that* all-season feeling

**T**he advanced technology that makes Nikken Far-Infrared Technology so superior for keeping warm is also what makes it uniquely suited to keep us comfortable the year round.

For those who prefer a lighter covering during the hotter months, Nikken offers its KenkoTherm Summer Comforter. The Original KenkoTherm Comforter, in a medium weight, is also a great mild weather choice. And both feature the same advanced Far-Infrared Technology as the Nikken Winter Comforter.

That's also true of Nikken ThermoWear Vests, Long Johns, Dress Sox and Sport Sox. All these items incorporate the unique ceramic-reflective fibers that help keep us feeling comfortable through a range of climates and seasons.

A technology that helps you to stay warm *and* allows you to keep cool—it sounds like the perfect solution to all-season comfort.



Nikken Far-Infrared Technology is just that. Thermowear Dress Sox, Golf Sox, Sport Sox, Long Johns and Vests. KenkoTherm Support Wraps. And KenkoTherm Comforters. It's a technology that works *with* you, to help you stay comfortable at any time of year.