

# Turning to Value-Added Technology to Differentiate

by Evan Clark

**NEW YORK** — In hopes of boosting demand for their products and commanding higher prices, fiber and fashion companies are dabbling in a myriad of space-age technologies that give apparel high tech characteristics.

While the consumer still will have to grin and bear hot summer days and spills from clumsy waiters, these technologies can help regulate temperature and offer water resistance. Fibers also are being made from some novel materials, such as corn, and are being blended specifically to have certain attributes.

Here's a look at some of the technologies and innovations being applied to the industry.

## PHASE-CHANGE MATERIALS

By absorbing, storing and releasing heat, phase-change materials, when incorporated into apparel, can help keep the wearer at a moderate temperature as body heat fluctuates.

An ice cube, which cools down a glass of warm water as it melts, is a good example of the process that makes the technology attractive for apparel.

Brad Poorman, global vice president of Boulder, Colo.-based Outlast Technologies, said the PCM are held in very small capsules "like ping-pong balls," thousands of which would fit on the end of a pin. The capsules are incorporated into fiber or added later to the fabrics.

As the wearer's body heat rises during exercise or even while sitting for an extended period, when perspiration can make one's shirt sticky, the PCM absorb the heat, which causes the PCM to melt and allows the skin underneath the fabric to feel cooler. The PCM harden again as body temperature drops, releasing the heat and allowing the body to feel warmer.

"We're trying to interact with your body, which is the heat source, and keep it at a very balanced temperature so you can be more comfortable longer," said Poorman.

Outlast trademarked the tag line "Not too hot, not too cold" to go along with its product. The materials can be tweaked to change phase from 75 to 95 degrees Fahrenheit, so socks can be made to regulate for a different temperature than shirts. In May, Outlast bolstered its position in the PCM market by acquiring rival Frisby Technologies. Lands' End and Joop are among the apparel lines that use PCM technology from Outlast.

## NANOTECHNOLOGY

Despite relying on particles that are microscopic in size, about 1,000-times smaller than a grain of sand, nanotechnology can have a big impact.

Greensboro, N.C.-based **Nano-Tex**, which is owned by Wilbur Ross' International Textile Group, makes use of nano-sized particles to add properties such as liquid repellency or absorption to apparel, said Renee DeLack Hultin, **Nano-Tex's** president of the Americas. The term nanotechnology refers to structures that are measured in nanometers. A nanometer is one-billionth of a meter.

"The repellency mechanism is very similar to a peach fuzz," she said.

The nano particles make up whiskers, which are attached to spines so they stand up straight and help keep water from sinking into fabric. The repellency lasts for 30 to 50 washes and doesn't affect the feel of the fabric.

"Our technology is very smart in the way that it assembles and goes onto the fabric," said Hultin. "We get a really good bind to the fabric so the chemistry doesn't come off."

While the technique can be used on fibers, the **Nano-Tex** products are often applied in the later finishing stages of apparel production.

**Nano-Tex** also markets a product that wicks moisture away from the skin, dispersing it so the fabric dries quicker, and another that helps fabrics made from synthetic materials seem more like cotton, with some moisture absorption and less of a sheen.

"We're just really in our infancy as far as what nanotechnology can do in the apparel market," said Hultin. "Every day, we're learning more and more about the fundamentals of this science to be able to bring better and better products to the marketplace."

## RENEWABLE RESOURCES

While petroleum-based fibers such as spandex and nylon have become mainstays in the fashion industry, their dependence on a finite supply of fossil fuels has some looking for fresh, renewable resources to join the likes of cotton and wool.

Stepping up into this new role, in at least a small way for now, is corn.

DuPont and Tate & Lyle in May formed a Wilmington, Del.-based joint venture, called DuPont Tate & Lyle BioProducts, that will build a manufacturing plant in London, Tenn., to create products from renewable resources such as corn. The factory is set to be up and running for 2006.

Tate & Lyle, based in London, specializes in extracting industrially useful chemicals from agricultural products such as sugar, corn and wheat. DuPont has substantially reduced its presence in the fiber business by selling its Invista unit to Koch Industries earlier this year.

The venture will use a fermentation and purification process to produce 1,3 propanediol, a key ingredient for the DuPont Sorona polymer, out of corn. Joe Carroll, global business manager for DuPont Sorona, said using corn makes for "a lower capital investment versus petrochemical."

He added, "By working from a corn-based substance, you have a much smaller footprint for emissions."

The polymer, which even after the factory is built will be only partially corn based, is now produced with a petroleum-derived PDO.

Sorona is licensed to Invista, Far Eastern Textile, Huvis, Saehan Industries and Fine Yarn Corp. ■

