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The Top Ten Nanotech Products Of 2003

Robert Paull, The Forbes/Wolfe Nanotech Report, 12.29.03, 12:16 PM ET

1) High-Performance Ski Wax

Already in use by the pros on the Canadian National Ski Team, Cerax Nanowax is one of the world's first products made using chemical nanotechnology, which creates "intelligent" surface coatings with multifunctional properties. A polymer just like P-Tex, the material used in ski and snowboard bases, Nanowax produces a hard, fast-gliding surface. The ultrathin coating lasts much longer than conventional waxing systems, while leaving the base free of buildup. And here's the "intelligent" part: Cerax Nanowax hardens as temperatures drop, adapting to the ski bases and snow crystals, so you can reach top speed from the first few feet on. The result? Unique glide properties and unprecedented performance on turns. Developed by German-based company **Nanogate** and sold through **Holmenkol** (the oldest ski company in the world), Cerax Nanowax comes in different formulations for different snow sports, such as downhill or cross-country skiing, as well as experience levels and conditions. And it comes in a handy 1.69 fluid ounce (50 milliliters) applicator.

For more information: <http://www.cerax.de>

2) Breathable Waterproof Ski Jacket

Our European readers might have an easier time getting their hands on Oberammergau, Germany-based **Franz Ziener GmbH & Co.**'s newest ski jackets with **Nano-Tex** enhancements. Nanotechnology makes the two-layer laminate windproof, waterproof, breathable and grime resistant--great for those bums who don't get around to washing their jackets until after the season. The result: a jacket with a long, functional life superior to coated jackets and competitive with Gore-Tex products. Don't be surprised to see these über-jackets popping up on haute couture mountains like Aspen, Jackson Hole and Sun Valley.

For more information: <http://www.ziener.de>

3) Wrinkle-Resistant, Stain-Repellent Threads

For the spillers, spotters and stainers among us (you know who you are), featured in our June 2002 "Nano Product Guide," Nano-Care fabric, made by Emeryville, Calif.-based Nano-Tex, is too exciting not to mention again. Nano-Tex researchers attached molecular structures to cotton fibers, forming a barrier that causes liquids and stains to bead up on the surface and prevent absorption. Treated fabrics are not only wrinkle-proof but repel stains from perennial offenders like soda, coffee, wine, mayonnaise and syrup. Similar to the popular waterproof coating Gore-Tex, Nano-Care is featured today in khaki, chino and corduroy pants for men and women made by **Eddie Bauer**, in Lee Jeans Performance Khaki by **VFC/Lee** (nyse: [VFC](#) - [news](#) - [people](#)), in Old Navy Super-Khakis and in men's twill pants made for Bass Pro Shops. Even **Tiger Woods**, through his **Nike** (nyse: [NKE](#) - [news](#) - [people](#)) clothing line, has chosen Nano-Care for his khaki golf pants.

For more information: <http://www.nano-tex.com/products/where.htm>

What do Hewlett-Packard, IBM, General Electric, DuPont and Intel have in common? All are investing in nanotechnology. To find out which nanotech stocks the Forbes/Wolfe Nanotech Report is buying now, click here.

4) Deep-Penetrating Skin Cream

Compared to conventional skin creams that sit on top of your skin, nanotechnology-enhanced cosmetic treatments penetrate deep beneath the surface and affect the base molecular layer. Take Plenitude Revitalift antiwrinkle cream by L'Oréal Paris, which introduced its first nanotechnology product in 1998. Plenitude uses a patented 200-nanometer nanotechnology process to incorporate vitamin A inside a polymer "capsule." The capsule acts like a sponge, soaking up and holding the cream inside until the outer shell dissolves under your skin. L'Oréal reports that of women surveyed who used the Revitalift technology, 80% reported antiwrinkle effectiveness, and 75% said the product was effective in firming skin.

For more information: <http://www.lorealparis.co.uk/>

5) World's First OLED Digital Camera

Digital cameras just got better, thanks to nanotech. As we first mentioned in March's "Nanodisplays: DuPont Takes On Kodak," organic light-emitting diodes (OLEDs) are much brighter than the liquid crystals (LCDs) used in many of today's flat-screen TVs and computer monitors. They boast a wider viewing angle than LCDs, which must be viewed head-on. OLEDs don't require backlighting as LCDs do, reducing power consumption. The world's first digital camera with an OLED display, the 3.1-megapixel EasyShare LS633 zoom digital camera by **Kodak** (nyse: [EK](#) - [news](#) - [people](#)), has a 2.2-inch screen that is up to 107% larger than the industry average of 1.5 inches.

For more information: http://www.kodak.com/eknec/PageQuerier.jhtml;jsessionid=1XZNTC0HDIWJNQHIQ3PHWLY?pg-path=31&pg-locale=en_US&requestid=309766

6) Nanotech DVD and Book Collection

No longer just the province of visionaries and geeks, nanotechnology is steadily making its way into our popular culture. Next time you reach for a book or DVD, try one of these and see if you can find the references from the nanosphere.

Don't miss the Nanotech Revolution! Forbes/Wolfe's Weekly Nanotech Insider will keep you up to date on the latest developments in this exciting new science. Sign up today. It's free.

7) Performance Sunglasses

If your next pair of shades carries the Smith brand, you may be investing in nanotechnology. Certain Smith models incorporate technology from Valley View, Ohio-based **Nanofilm**, which uses nanotechnology to produce protective and antireflective ultrathin polymer coatings for eyewear. Founded in 1985 as a spinoff of research on the self-assembly of polymers at Case Western Reserve University, Nanofilm has grown to become one of the largest producers of protective glass coatings in the U.S. To give the glasses antireflection and scratch-resistance functionality, Nanofilm deposits coating layers of 150 nanometers and 20 microns thick, respectively. Then it uses chemical self-assembly to form a polymer coating, three to ten nanometers thin, on the outer layer of the antireflective lenses. This not only seals and repels grime and skin oils but also makes the lenses more responsive.

For more information: <http://www.smithsport.com/>; <http://www.nanofilm.cc>

8) Nanocrystalline Sunscreen

Whether you're heading to the islands or the slopes this winter, you may want to slather on a bottle of NuCelle SunSense SPF 30 sunscreen. Its main ingredient is Z-COTE, a substance made with nanotechnology by **BASF** (nyse: [BE](#) - [news](#) - [people](#)). "Nano-dispersed zinc oxide is the basis of Z-COTE," says BASF's **Dieter Distler**. The common SPF (sun protection factor) rating system only rates protection against UVB rays. Zinc oxide provides broad-spectrum protection against UVA and UVB rays, but its characteristic white pasty goop often leaves sunbathers and lifeguards feeling like they're wearing clown makeup. The nanotechnology in Z-Cote produces a high-purity nanocrystalline zinc oxide, which allows the sunscreen to go on clear. And, to boot, the inorganic Z-COTE can't be absorbed by the skin and won't cause allergic reactions.

For more information: <http://www.nucelle.com/>

9 & 10) High-Tech Tennis Rackets And Balls

Each year tennis racket manufacturers, from **Wilson** and **Prince to Head and Yonex**, vie to introduce the most technologically advanced and highly engineered products. In the 1970s, it was aluminum; the 1980s, graphite; the 1990s, titanium. Now comes nanotechnology. The 127-year-old French manufacturer **Babolat** introduced the VS Nanotube Power racket in 2002, retailing for \$250. The Nanotube Power and VS Nanotube Drive lightweight, oversized-head models are made out of high modulus graphite with carbon nanotubes supplied by France's **Nanoledge**. One hundred times stronger than steel, yet one-sixth the weight, carbon nanotubes increase the rigidity of the stabilizers on each side of the racket's sweet spot. Babolat credits this with increasing torsion more than 50%--and flex resistance upwards of 20%. The result? VS Nanotube rackets are five times more rigid than current carbon rackets and pack significantly more power.

But what good is a nanotech racket without nanotech tennis balls? Regular balls left out of the can become flat and unplayable after two weeks or less. But Wilson Double Core tennis balls, with Hillsborough, N.J.-based **InMat**'s Air D-Fense nanocomposite product inside, remain playable for four weeks. Sure, they cost about \$1.50 more per can, but you double the life of the balls for half the incremental cost of a new can of ordinary tennis balls. InMat founder and President **Harris Goldberg** says that natural rubber--which is required to obtain the correct bounce--is very permeable. So InMat makes it harder for the air to escape by coating the ball's inner core with 20 microns thick of layered sheets of clay polymer nanocomposites--each 1 nanometer thin. There is no change in bounce or weight, and the player can't tell the difference. Wilson's Double-Core Balls are now the official balls of the Davis Cup.

For more information: <http://www.babolat.com/>; <http://www.wilson.com>.

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