



b i o n i c

[B O D I E S]

Increasingly, companies claim that clothes with “body mapping” will make people **FASTER, STRONGER, BETTER** than they were before. But does it really work?



BY THERESE
IKNOIAN

more than three decades ago, Steve Austin—aka the \$6 Million Man—was the ultimate bionic wonder, a TV show astronaut whose body was rebuilt with computerized parts to make him the world’s first cybernetically enhanced super-person.

“Gentlemen, we have the technology,” the 1970s show intro claimed. “We have the capability to make the world’s first bionic man. Better than he was before. Better. Stronger. Faster.”

And that, gentlemen (and ladies, too, of course), is what today’s newest technology is claiming it can create. All you have to do is put on the right apparel or socks—ones that are “mapped” to suit the needs of different parts of your body during different activities—and you too can become better, stronger, faster—not to mention cooler, warmer, more supported, less fatigued, more ventilated or just plain more comfy.

“The question is: How can you maximize what it is you have and minimize what it is you lose by whatever you’re wearing or using?” said Jim Kleinert, Ph.D., an orthopedic hand surgeon who is the founder of the company, Bionic Glove. “That’s really the challenge, isn’t it?”

In the last couple of years, more and more companies in the outdoor and athletics industries have taken on the challenge, adding lines with names like “biomorphic,” “body mapping,” “biomapping” or “comfort mapping.” All of which claim to make you, like Steve Austin: better, stronger, faster. Sounds a little like the veritable magic bullet. As one company claims, “High performance is now as easy as getting dressed.” But is it really?

WE HAVE THE TECHNOLOGY

The science upon which this mapping technology is based isn’t new. For many decades, there have been biomechanical engineers, biomechanists, environmental physiologists, thermal scientists, surgeons, kinesiologists and others studying the human body, how the bones and soft tissues function and interact, how the body heats and cools itself, and in general where we sweat, strain muscles or need support. Most of those patterns are based on distribution of sweat glands, fat and muscle in men and women. What’s new and why the industry is suddenly working these concepts into apparel, outerwear and socks is the mills and their machinery, not to mention the computers that now drive them, have the ability to weave and knit yarns and fibers into fabric and, ultimately, into one garment that has different textures, thickness and elasticity with or without seams.

“Electronics have had a big impact,” said Stan Mavis, president of Sugoi. Over the last 25 years, he has overseen Hind, Pearl Izumi, Asics and Brooks, at each stop usually fast-forwarding the company’s apparel technologies, including Sugoi’s new, body-mapped Tactic T. “Now with all the machines computerized and the multitude of yarns available, the possibilities are pretty interesting.”

Much of the apparel mapping technology was born about five or six years ago in soccer jerseys or running singlets. It wasn’t until about two or up to three years ago



Help save their soles.



Shock. Friction. Instability. The trail can be rough on your customer's feet. But whether they're walking around the block or hiking the A.T., you can help them every step of the way. With its unique PolySorb® Shox™ cushioning system, Spenco® Outdoor Series™ Footbeds reduce friction and provide the best combination of shock absorption and stability. Guaranteed.



SPENCO®

www.spenco.com
800-877-3626



that the mapping technology started to show up in all kinds of other clothing. That was partly due to the mills' advancements in the manufacturing of seamless garments that could vary the thickness of yarns or openness of a weave as it knit the garment. With those advancements came the ability to manufacture apparel in smaller quantities, thus making the concept available to more companies. At that time, it was "revolutionary," said Patty Kelly, Hind director of product and marketing.

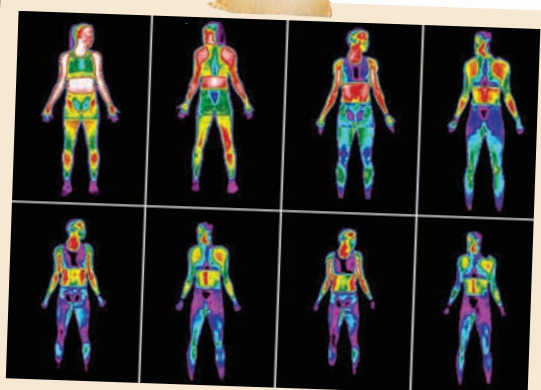
In a turn of affairs, it's also been the mills, for example in Turkey and Israel,

I feel colder on my chest. Of course, my hamstrings are tired and sore. As Glenn Crowther, Gore-Tex product specialist, said, people have been doing this on their own with scissors and tucks, for example, cutting off shirts to the chest or tying sweat-shirts around the hips. "It just makes sense intuitively," he said of the Gore-Tex Comfort Mapping concept that was the first in outerwear, winning awards in early 2006 for its use of different protection made possible because of Gore-Tex's newer seam-sealing technology.

Naturally, GearTrends® wondered how much of this was hype and how much of it was based in science—in other words, how does a company really know what fabric, weave, thickness or particular direction of stretch works best where? What we found is most companies really aren't willing to share research or the source of it, just claiming instead that they have it or showing only glimpses. Some companies straight out claim a wide base of athletes who just use the

analyze fatigue and have analyzed injuries relative to warm-up and cool-down periods as a part of development. "This exhaustive study has culminated in CW-X conditioning wear," the website CW-X.com stated. Unfortunately, no studies have been done outside Japan. A company spokesman said the company fully intends to do U.S.-based studies to backup its claims, but the cost has been prohibitive. Although certainly not the only valid scientific community in the world, North American journals are known for their strict standards and high requirements, including review by research peers before publication to assure quality and thoroughness in study methods and conclusions.

Introduced a year ago, Asics is another one of the few with mapping technology for support, which it calls "biomorphic." It has a partner in Australia called Winds that claims to have empirical data, and its website (www.skins.com.au) states the line it markets Down Under called Skins has been endorsed by the Australia



« Cooling patterns of skin in a female subject exposed to wind over one hour.

that have been developing new weaving and stitching and then coming to the manufacturers to say, "Hey, look what we can do, how do you want to use this?" As Poppy Gall, Isis co-founder, said, "They're thinking outside the box and not waiting for customers to come to them."

But the mills also listened to their customers since these technological opportunities left the door wide open for company designers to push the envelope of creation and think outside, sometimes waaaay outside, the box.

"The availability of the technology has driven the designing," Gall added. "The garments look nice, they wear well, and it puts a different twist on body layers."

DISSECTING THE SCIENCE: DOES IT WORK?

No one can argue that the mapping of varied types of fabric to mix varying degrees of insulation, windproofness, waterproofness, support or ventilation in different places in a garment or sock seems a bit like a no-brainer: Yeah, I feel sweeter at my waistline, around my bra line. Sure,

» Patented design elements of Bionic Glove incorporates the anatomy of the hand to reduce friction and pressure on bones and decrease hand fatigue.

stuff they create and tell them if they like it or not, research be damned. Some claim a mix of science and grassroots research, but still won't tell outsiders about what their research says or when and how it was done. Malden Mills said its mapped fleece, now exclusively with Patagonia, came about because of a request by the military to develop this sort of garment and that it was tested in army labs.

A few try to give enough information to convince consumers they've done their homework. For example, CW-X's mother company, Wacoal Sport Science, one of the first companies to widely market mapped support in tights and tops for activities like running, says it has more than four decades of research under its belt done at the Wacoal Human Science Research Center in Kyoto, Japan, on more than 30,000 people. There, the scientists have used electromyographical studies (showing how muscles fire) to



Physiotherapy Association (a trade group for physical therapists) and that it has had research published. Asics declined to supply information or contacts, and emails to Skins went unanswered.

Bridgedale has even taken the mapping concept into its X-hale line of socks, out since 2003, but it wasn't the first with mapped ventilation, cushion or warmth for socks. That title goes to a Swiss sock company called X-Socks (www.x-socks.com) that is just recently trying to enter the U.S. market through a distributorship with Elan.

Interestingly, a company called TC2 that has full body scanning equipment to research all kinds of information about the human body, including heating and cooling, has never been called on by a customer to

PHOTO COURTESY OF LOUGHBOROUGH UNIVERSITY, RESEARCH COMPILED FOR ADIDAS.

PHOTO COURTESY OF BIONIC GLOVE.



» To illustrate heating and ventilation patterns, the scan shows body ventilation in the red and yellow areas and body warmth in the blue and green areas.

look at mapping needs for apparel like this. However, David Bruner, Ph.D., vice president of technical development, said the possibility of mapping ventilation, heating and support needs to different body areas seems legitimate, albeit a bit ahead of the current technology curve.

"I'm not sure if the companies supplying these products know enough yet," Bruner said. "But there's a lot of opportunity in this area."

Even an environmental physiologist at Loughborough University in England, where adidas worked with scientists to develop its mapped technology several years ago in preparation for the 2004 Olympic Games in Athens, called body mapping in apparel as "the next stage in clothing design," but one that isn't necessarily fully researched and proved yet.

"Despite impressions that may be made by some manufacturers, the science behind it is rather new and still full in development," George Havenith, Ph.D., professor of environmental ergonomics and physiology, told GearTrends® in a series of emails.

"The work in progress now is to try to link these factors, such as sensitivity and

regional responses, which should provide the 'body map' for both of those. Obviously, sensitive areas and areas with, for example, high cooling power are most interesting to target, for example, for extra ventilation in the heat," Havenith wrote. "So, in essence, the sensitivity map and the physiological response map will tell the designers how to optimize their clothing design.

"As you have seen, first attempts have been made with sports clothing, where we based the ideas on knowledge available in the scientific literature and some experimentation by ourselves," he explained. "However, there are still large gaps in our knowledge and that is our work program for the coming years.

"Not much is published on this, I'm afraid," he added. "It is what you call 'ongoing work.'"

The companies GearTrends® spoke with mostly said "it works," "it's intuitive," "it's a gut feeling," or "you feel it."

When we dissect the science, then, does it work? The answer, so far, is a loud and rousing...maybe. We just don't really know.



DISSING THE SCIENCE? NOT YET

Even without hard science, that doesn't mean anybody is truly dissing the ability of mapped apparel and socks to help a wearer feel more comfortable. Even the scientist Havenith pointed out that clothing design has seen loads of varied development "of which most has proved its worth even without designers and developers having all the science input."

Why? Because, as Chris Lussier, brand manager for Bridgedale, said, "Comfort is a very personal thing." A scientist may not really need to tell you if you feel good or if something seems to make you feel better. You just know you do. Can you run faster? Well, that's perhaps debatable. Do you get fewer injuries? Hm, can't prove that one because there are so many confounders.

PHOTO COURTESY OF WALDEN MILLS/POLARTEC

The NALGENE® OTG bottle offers easy one-handed operation so you can pop the top and take a drink without letting go of your momentum... or anything else for that matter. Now available in pretty pink.

www.nalgene-outdoor.com

MADE IN USA



HIGH SIERRA®

TRAVEL & HYDRATION

FOR THE FUN.
FOR THE CHALLENGE.
FOR THE ADVENTURE.



800-323-9590

WWW.HIGHSIERRASPORT.COM

HIGH SIERRA®
IS THE INTELLIGENT
CHOICE FOR DURABLE,
AFFORDABLE TRAVEL
& HYDRATION GEAR.



But athletes seeking the tiniest edge for performance—and that may even mean simple comfort—will jump on the bandwagon if a claim seems legit.

“Placebo works 30 percent of the time,” said Jan Bear, an orthopedic surgeon in Albuquerque, N.M., an elite adventure racer and captain of CW-X-sponsored Team Santa Fe. “Is that bad? No, it’s not. Placebos and the mind are very powerful. As long as you feel better, who cares?”

Of course, he added that his team seems to notice less muscle fatigue and the racers like the feel of the tights and tops they’ve used for nearly four years now. “Maybe we don’t have scientific evidence that it works,” he said, “but people do feel better.”

Kleinert, whose Bionic Glove company (www.bionicglove.com) has 14 patents and 40 patents pending, has seen his gardening and general gloves used for the likes of paddling and trekking, not to mention by arthritis sufferers. “It’s a quality of life issue,” he said. “It gets down to the end users. Their hands feel better. They can do what they love. You are gaining strength and comfort. Those are exciting things for us.”

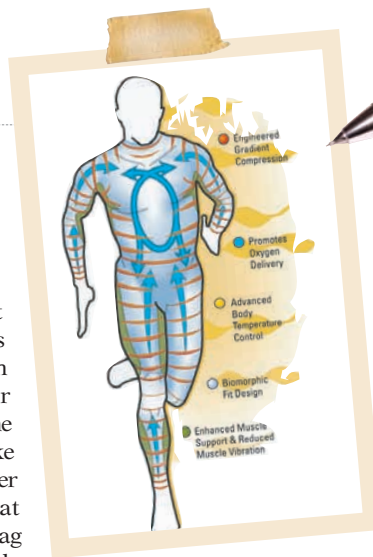
Aside from feeling more comfortable, a

few manufacturers don’t hesitate to mention as a big selling point that the pieces stand out from the others on the rack. Just seeing the various panels or mesh areas in a shirt, pair of tights or pair of socks can help the customer decide to take it to the checkout counter over another piece that might state on a hangtag that it breathes but looks sort of ho-hum.

“It’s such a visual element,” said Patty Kelly of Hind. “Consumers can understand it and that helps it tell a story.” And Asics’ Shannon Scott, director of marketing, said consumers are not only curious, but they’re also willing to pay “a few extra bucks” for it. That could be music to retailers’ ears.

BIONIC FUTURE

The new technology that can differentiate garments and help sell one shirt or pair of tights over another means manufacturers



are hitting the fast-forward button to get more to market. Competing products will look truly different in many more ways since the mapping concept combines technology and design. Many companies will show additional refinements for 2007 and promise really big things in their use of mapping technology in 2008.

“Personally, I’m really excited about how many great companies and great products there are out there,” said Mavis of Sugoi. “It’s created a competitive landscape where people have to differentiate themselves.”

Just as Steve Austin as TV’s \$6 Million Man became better, stronger, faster, so too could this technology convince consumers they’ll be able to do more and do it better, giving retailers and their suppliers another route on the product map to explore.

» To download extra copies of this magazine, as well as back issues, go to www.geartrends.com/magazines.

ILLUSTRATION COURTESY OF ASICS AMERICA

At Sierra Designs, we’re still as real, innovative, adventurous and fun as we were over 40 years ago. Get the lowdown at booth #25039.

**SIERRA
DESIGNS**



WOOLRICH®

EST. 1830

For more than 175 years Woolrich has offered products inspired by the outdoors. To see our exciting new line, visit us at the Summer OR Market, booth #19001/20001. Or call us at 1-800-995-1299, ext. 660, for a dealer representative in your area.

Made to be lived in.

