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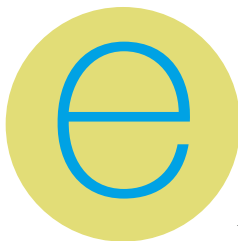
The textile industry traditionally has been conservative and slow to change. But emerging technologies soon will have a revolutionary effect on the way interior designers proceed through the 21st century.

BY ADRIENNE J. REWI

PHOTOGRAPHY BY CONEYL JAY/GETTY IMAGES



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Electronic textiles currently are attracting the most interest in textile research globally, and their effect on the textile industry will be colossal.

“It is only a matter of time before there is a micro-computer in every item of apparel sold,” predicts Barry Holcombe,

Ph.D., Senior Principal Research Scientist at Australia’s Commonwealth Scientific and Industrial Research Organization (CSIRO), Textile and Fiber Technology.

It is an easy step from apparel into the world of interior textiles. With the basic technology already available, we will soon see innovations such as smoke detectors incorporated into curtains and cushions that can adjust to the weight of the person sitting on them. Once designers embrace new technologies, the textile industry will have to change.

“In the future, we’re going to see the wholesale merging of the textile industry with a wide range of industries, particularly the electronics industry,” Holcombe says.

POSSIBILITIES

A primary area of research at CSIRO is yarns with conductive properties made into washable, flexible textiles. In collaboration with the University of Wollongong’s Intelligent Polymer Research Institute (IPRI), CSIRO is researching functional and intelligent polymers, a relatively new class of materials, which have properties previously only achievable through metals or solid state devices. These polymers’ high-strength, electrical conductivity, ability to store energy and convert it to light or mechanical action, and their ability to sense chemicals or to respond via controlled release or technical action puts them on the list of hot new textiles.

IPRI is one of the world leaders in this rapidly emerging field, and Holcombe says they now are developing textile batteries for storing energy from solar panels in flexible clothing. Textiles with temperature-monitoring capabilities will be perfectly feasible using

this technology, opening the way for innovations like curtains, upholstery and wall coverings that adjust the temperature and humidity of a room.

One commercially successful application of electrical textiles is *Softswitch™* technology, pioneered by Canesis Network Ltd., Christchurch, New Zealand. *Softswitch* combines a variably resistive composite material with conventional textiles to produce switches and sensors that are flexible and look and feel like conventional textiles. Washable and durable, they can be made from a wide range of fabrics, using conventional textile manufacturing techniques. Burton Snowboard is one of the first apparel companies to create a wearable electronic jacket, which incorporates an Apple iPod operated by a *Softswitch* sleeve panel. *Time* magazine named it “one of the coolest inventions of 2002.”

Stewart Collie, Science Manager at the Smart Textiles Innovation Centre, Canesis (UK) Ltd., in Ilkley, England, says there is a tendency to look at wearable applications of new technologies first because they generate greater global interest, but he sees a promising future for the technology’s application in interior textiles. Canesis already is working with automotive industries and medical suppliers to this end. The *Softswitch* technology could be incorporated into armrest upholstery to remotely control televisions and stereos, and pressure-sensing textiles already can identify chair occupants and adjust foam content accordingly.

“We’re extending technology into fabrics,” Collie says. “Laying electro-luminescent components directly onto fabrics in a way that retains the flexibility of the underlying textile. That technology could be used to create wall coverings or drapes that illuminate interiors in new ways.”

Collie believes the major breakthrough to making intelligent textiles is actuation. That will enable textiles to move in response to stimulus – a garment that changes its porosity in response to windchill or drapes that change their structure depending on their exposure to sun to provide light protection.



the science of touch

Touch is the first of our senses to develop, and it provides our most fundamental means of contact with the world. It is essential not only for our well-being but also for the sensory development of body and mind. Yet we live in a visual world, bombarded by thousands of visual sources of information, in which the more emotional senses of touch and smell become marginalized.

Charles Spence, Ph.D., leading Experimental Psychologist at Oxford University, England, and author of *The ICI Report on the Secrets of the Senses*, says we live in a touch-starved society, triggered in part by threats of litigation associated with inappropriate physical contact. That touch shortage may be having detrimental effects on both our

health and well being. He urges people to recognize their fundamental need for multi-sensory stimulation and to adopt a new philosophy, based on a greater understanding of the way senses work in harmony, called Sensism.

“Sensism has the potential to deliver a society-wide antidote to the stresses of modern living in the form of a multi-sensory boost,” Spence says. “It requires the creation of new sensory environments that consider everything from the color of walls and the ambient scent of our surroundings to the background music playing and the texture of our food, flooring and furnishings.”

There is a growing belief that if we are not to suffer the negative emotional consequences of touch deprivation, we need

to supplement the tactile aspects of our environments by filling them with textured surfaces that can more effectively stimulate our sense of touch. Research has shown that delivering a truly multi-sensory boost will make us significantly more productive and successful.

In the workplace, that can include touch-toys that provide people with pleasant tactile stimulation. New inventions such as a computer mouse that can provide tactile feedback via a series of electric motors, computers that enable users to feel the texture on their screens, and latex mobile phones that enable people to communicate by touch as well as speech are all in prototype stage and may feed our need for touch.

“That sort of thing will be available in five to 10 years and mainstream within 20,” he says.

With the support of Australian Wool Innovation (AWI), Collie and his research team have developed a range of heated wool textiles. These use electrically conductive fibers in combination with wool, creating textiles that radiate a uniform gentle heat. AWI’s heated socks recently captured worldwide attention.

Stuart McCullough, AWI Manager, Product Commercialization, says the same technology now is being applied to heated bedding, and heated drapes or upholstery easily could plug into the main supply or incorporate *Softswitch* technology.

At the North Carolina State University College of Textiles, James Watson, Associate Director of Applied Research, says numerous manufacturers are working with the research facility on proprietary textile projects. “We have recently made fabric imbued with sound deflection properties, which we have tested for use in the London Royal Pavilion Festival Hall. That is just one example of the exciting new ways textiles are developing,” he says.

Another radical area of research is the development of non-woven textiles, which many say will be the products of the future. CSIRO’s Holcombe says they are “already a huge growth industry, a very significant part



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of the global textile market, with huge advantages in high production rates, significant cost savings, durability and the creation of entirely new product opportunities.”

Macquarie Textiles, an Australian woolen and worsted textile company, has a manufacturing partnership with AWI to commercialize new non-woven products being developed from the three-year AWI-funded project at Canesis. Its new plant has the potential to produce more than a million meters of needle-punched wool fabric a year.

John Lewis, Macquarie Textiles Managing Director, says the potential to achieve lighter weight, more stretchable and better draping fabric demonstrated by Canesis will open new markets across a range of consumer products.

“Non-woven wool provides another dimension to wool fabrics, exploring boundaries that could never even have been considered previously. We have received considerable interest from many companies considering its use in non-traditional areas of wool,” he says.

One of those areas includes non-woven wall coverings, which are being developed by Canesis. The technology produces abrasion-resistant fabrics ideal for commercial settings that may require softer audio effects, less echo, greater visual or tactile effects, increased warmth and greater control of moisture vapor.

IN THE MARKETPLACE


Tom Habib, President of Bloomsburg Carpet Industries, Inc., Bloomsburg, Pa., says designers and architects are increasingly looking for high-end positive products with green properties. He believes recycling – “still in its infancy” – is the biggest issue facing the textile industry. He is skeptical about radical smart textile advances – “show me their worth, their justifiability” – and believes researchers' time would be better spent discovering ways of addressing recycling and clean air issues.

Canesis, in collaboration with the St. Louis School of Public Health and with substantial funding from the U.S. government, is in the midst of a three-year study to gain a better understanding of the complex interplay

of interior furnishings and particulate air pollutants. Similar international linkages also are flourishing with the American Association of Textile Chemists and Colorists and the United States Carpet and Rug Institute. Using funding provided by the Health Research Council and the Foundation for Research, Science and Technology, Canesis researchers also are collaborating with teams at Otago and Victoria universities to investigate how allergens and bacteria accumulate in domestic environments.

“Green” textiles are a very important phenomenon, according to Eric Schneider, Publisher of *Fabrics & Furnishings International*. “We already have biodegradable ‘green’ fabrics being designed using organic dyes and fibers. The issue is whether people want to pay the price for eco-fabrics. They talk the talk, but they don't always walk the walk because of the expense.”

Schneider believes nano-technology will provide the greatest future fabric advances, producing fabrics that can warm, chill, change color and emit aroma, in addition to having inherent flameproof properties, integrated lighting and the ability to illuminate rooms. “It behooves people in the textile industry to be able to produce shorter runs of very diversified, technologically-advanced niche products if they are to survive in the textile world of the 21st Century,” he says.

For all the rapid technological advancements, there is an urgent need to generate more successful commercial outcomes. “There is a great deal of exciting, fundamental work being done,” says Robert Finch, Manager, Research and Technology Marketing, Canesis Network, Christchurch. “But the consumer and industry base has had a lot of promise of potential in the last few years. There's a bit of disillusionment creeping in with the lack of genuine product opportunities out there. We may need to step back and refocus on the real consumer benefits that are possible. Otherwise, it's all just potential.” 

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ADAPTED AS AN EXERCISE BY HEATHER JAKUSZ, DIRECTOR OF EDUCATION AND PROFESSIONAL DEVELOPMENT

exercise:

- 1) What kinds of electronic textile combinations can you see being introduced to the design community in the near future? Name four.
- 2) Explain both the negative as well as the positive outcomes that may affect the design industry by way of electronic textiling.
- 3) Describe some boundaries or limits in the way these textile electronics are used in everyday living.
- 4) In what ways can electronic textiles be used positively in the name of sustainability? In what ways can they be used negatively?
- 5) How will the new products affect the more traditional creativity of the interior design profession?

instructions:

Individuals who read this article and complete the series of questions above are eligible to receive continuing education credit (CEUs), as approved by IIDA. Completed exercises should be returned to IIDA via:

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Clients aren't what they used to be.

