Miami Event Integrates Technology and Fashion. By Kathlyn Swantko

Developing Wearable Electronics

What does the softgoods market need to learn from the consumer electronics market regarding wearable technology? This year's 2012 Smart Fabrics Conference drew innovative entrepreneurs and executives from a diverse cross-section of application segments from around the globe to address this question.

Bright Lights: This theater dress, designed by Galina Mihaleva from Arizona State, shows the use of luminous electronics.

Michael Corbett, general manager for WEEL Technologies, highlighted four important directives for those interested in wearable electronics: 1) Think long term; 2) Pay attention to the consumer electronics market; 3) Hire engineers, specifically mechanical engineers and electrical engineers; and 4) send these people to the Smart Fabrics Conference every year to stay on top of the market.

Hap Klopp, chairman of Cocona Fabrics, added his advice on building and marketing a new wearable technology. He stated, "Innovation is going to sweep away those textile/apparel companies that are not involved in technology, so you have to be willing to take a risk."

Klopp said if you apply technology to a commoditized field, you need to tell the world about your technology, highlighting the differences between the products' features and benefits. He noted, "Innovation is a combination of invention and commercialization, but differentiation is key. Put quality into all your products, because people can't copy quality!"

In designing wearable heatwear technology for the market, Steve Leftly, CEO of Fibertronic Limited, explained the importance of keeping the technology simple, and innovating the details. "In developing a smart heatwear fabric panel technology, there are several key details to follow. The innovative fabric must be lightweight. It must be breathable. It must have stretch, with no design restrictions. It must be bondable/weldable, involving complex shapes or patterns. And, it must have high durability, meaning it must be washable or dry-cleanable."

Leftly also highlighted the challenges for developing details for usable battery technology, including the fact that the battery innovation needs to be form fitting, and it needs to be as lightweight as possible, utilizing a quick, simple charge.

Sensors are also an important issue in wearable technology. Clothing+, an industrial pioneer in the field of textile electronics and sensors, has been working with textile sensors and wearable technology since 1998. Sensor belts for heart rate monitors (HRM) are already in the market, with several million being sold each year.

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STEVE LEFTLY, FIBERTRONIC LTD

Going forward, Akseli Reho, CEO of Clothing+, cited potential future sensing needs, in addition to HRM, that may include EEG to measure electronic brain activity, EMG to measure electronic muscle activity, bio-impedance devices for measuring non-invasive body composition, galvanic skin response (GSR) for measuring electrodermal responses on the skin, measuring body bending/stretching, and measuring body temperatures.

Because there is a growing interest in personal well-being, Reho expects that the next logical next step is to bring sensors and sports underwear together. He projects that sensing will be the main function for underwear over the next few years.

Here are some of the interesting innovations presented at the 2010 Miami Conference:

- **ElastoLite, by Oryon Technology**, is an innovative, next-generation technology in electroluminescent light, which enables thin, flexible, water-resistant lighting systems to be incorporated into a variety of applications. ElastoLite is machine washable and dryable and emits no heat.
- **Express Circuits Group Ltd.** Specializes in the design, manufacture and assembly of complex printed circuits supplied in small to medium batch sizes. The company recently pioneered the production of Stretchable Printed Circuits using a Stretchable Substrate for a variety of applications.
- **PatienTech/Vista Medical**'s patented elastic sensors, made from a spandex material, are currently available at retail in such smart products as pillows, seats, and beds for medical applications.
- **SEFAR PowerMatrix** is a hybrid fabric consisting of a lightweight, flexible polyester (PET), metal, and marker monofiliments in the warp and weft. The electrically conductive metal wires in the warp and weft are insulated by a thin polymer coating, which enables the metal wires to form a grid without electrical contacts between the wires.

Looking ahead, the future for E-Textiles has challenges. Stacey Burr, VP-wearable sports electronics for Adidas, noted, "Interfacing Smart Clothing to the Smart Phone will be key for measuring such things as calorie intake, alcohol consumption, and body activity."

Leftly, from Fibertronic Limited, summed up the challenges for commercialization of wearable technology in this way: "Wearable technology adapts very slowly. The lessons learned in the development of successful adaptation of wearable technology can be taken from the consumer electronics market. There must be brand acceptance, the technology must be consumer acceptable, and the technology must be offered at an acceptable price point."