

# Transformed into light

By Linda Loyd

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CeeLite has lighted the two-story Madonna window displays at H&M's Fifth Avenue store in New York. The lighting - paper-thin sheets of plastic that can be twisted and wrapped around things - has been commercially available to architects and designers since early last year (though it's not sold in retail stores).

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When Ahmir "Questlove" Thompson and the Roots take the stage on tour in Europe this summer, the Philadelphia hip-hop band's drums will be wrapped in a flat, flexible lighting created by a Blue Bell company, CeeLite L.L.C.

The Red Hot Chili Peppers have similar illuminated drums. And soon the drums of the Black Eyed Peas will be draped in what CeeLite calls the "world's first flat lightbulb."

The technology, invented by H.P. Huang and scientists in Taiwan, is paper-thin sheets of plastic, known as light-emitting capacitors, that can illuminate any surface - from pillars and floors to billboards and transit buses.

While traveling through the Beijing airport in 2003, Huang ran into James Chen, an MBA classmate in Taiwan. The two talked and Huang showed him the electroluminescence technology that would eventually lead to CeeLite.

Chen took a sample to show Malcolm Hayward, his former partner at Quadritek Systems in Malvern. Hayward, in turn, showed the product to Michael Binder at Capital Manufacturing Co., a sign fabricator in Lansdale.

Binder, who had worked with lighting on more than 300 stadiums, convention centers, arenas, nightclubs and casinos, said: "I had never seen anything like it. Intrinsicly, I knew that the applications would be endless."

Unlike traditional incandescent, fluorescent, LED (light-emitting diodes) or halogen lighting, this flat

light comes in sheets as thin as a plastic card that can be cut, twisted, and wrapped around nearly any surface, indoors or out.

The panels are layered inside with phosphors, manufactured by Osram Sylvania in Towanda, 140 miles north of Philadelphia. When the phosphors are charged with electrical current, they emit bright white light.

CeeLite, which says it is the first company to manufacture and market LEC technology, is putting light in places not thought possible before - countertops, walls, street signs and even clothing.

CeeLite has lighted the two-story Madonna window displays at H&M's Fifth Avenue store in New York, and illuminated walls at Caesars Atlantic City casino.

Since November, when Time magazine named the technology one of the "best inventions of 2006," CeeLite's Web site has received more than four million hits. The lighting has been commercially available to architects and designers since early last year. (It is not sold in retail stores.)

The lighting also has been used to illuminate the CNN Headline News set, backlight PC keyboards, and in advertising on billboards for Virgin Atlantic in seven cities. It has been used on transit buses in Los Angeles, and soon will be on the outside of buses in Memphis, Nashville and Cincinnati.

The company is negotiating with a Taiwan cell-phone manufacturer to put the technology in mobile phones.

Three Cape Coral, Fla., brothers have teamed up with CeeLite to install illuminated graphics on denim jackets. A small battery pack inside the jacket allows wearers to turn the light on and off, and even make it flash.

CeeLite also is collaborating with DuPont Co., which manufactures Corian, to pair LEC lights with translucent Corian to give kitchen, bath and commercial countertops and surfaces a glow.

The governor of Kentucky announced recently that the state would install the lighting on street signs at 47 busy intersections in Lexington and Fayette County in preparation for equestrian games in 2010.

LEC panels currently cost from \$35 a square foot to \$80 a square foot and come in sizes up to 18 square feet. The lights can run on regular household electricity, or run off battery-powered systems.

CeeLite said its products use 80 to 90 percent less energy than incandescent light and 50 percent less than fluorescent light, and generate no heat.

It originated from another light form known as electroluminescence, which has been used for years in nightlights, watches, cell phones and car dashboards.

"Nobody had ever been able to get it larger than about four inches by four inches" until Huang, CeeLite's chief technology officer, and scientists in Taiwan made the light work "in a bigger format," Binder said. "We've been able to make it work in all kinds of environments, make it bright and sustainable."

The promise so enticed Binder that he left Capital Manufacturing after 30 years to cofound CeeLite with Hayward and Huang in May 2004.

The founders and their family members and friends invested about \$4 million in CeeLite, which bought the Taiwanese factory where the panels are made.

The company, with 18 employees in Blue Bell and 60 in Taiwan, plans to raise \$3 million to \$6 million in venture capital this summer. After that, CeeLite will move manufacturing from Hsinchu, Taiwan, to the United States - most likely the Philadelphia area, Hayward said. Researchers and scientists will remain in Taiwan.

The bulk of the raw material comes from the United States and is shipped to Taiwan, where the panels are made and then shipped back.

"The smart thing for us to do is get rid of the long supply chain and produce it here," Hayward said.

The chief executive officer said his "personal goal" is to manufacture larger panels, 4 feet by 8 feet, which is the size of drywall used in construction.

"We have the technology to make it bigger; we just don't have the machinery," Hayward said.

CeeLite expects to become profitable in the third quarter, and have about \$10 million in revenue this year. The company plans to "more than double" revenues next year, and keep doubling sales in 2009 and 2010, Hayward said.

Although it's designed as a secondary or back light, CeeLite's goal is to increase the brightness so that one day it could be a primary light source in a home, school or office.

But it will not be light that shines on objects; the objects will be the light.

"You will walk into a room and your baseboards will light up, or your headboards" on a bed, Binder said. "You will take a shower and the shower floor will be the light."

CeeLite is working with manufacturers to make that happen now.

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