e-Skins…

by Mark Fihn

We've written about e-Skins before. We've even showcased them during public presentations. But it wasn't until I actually saw Kent Display's demonstration of e-Skins at SID in San Antonio earlier this month that I realized just how important this development really is…

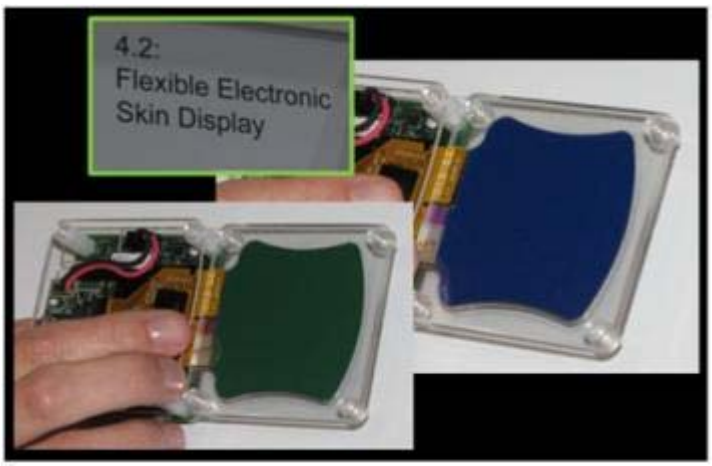
Kent's e-Skins are film laminates 65 microns thick with cholesteric liquid crystal technology inside. Color can be changed on command, and power is utilized only during the color shift process. Once the color is in full display, the electronic skin uses no power whatsoever to maintain the color. The skin can be cut into any desired shape and made to conform to the surface of a personal electronic device. The company's first generation e-Skins are available in eight different colors. The color can be changed in response to an action taken by the user, (such as pressing a button). But the e-Skin can also change color based on some other thing – like identifying the caller on a cell-phone or as a reminder for a meeting.

In May, Kent announced a $4.9 million award from the Ohio Third Frontier Commission's Research Commercialization Program. The award is being used to develop e-Skins and other cholesteric LCD products. Kent Displays' program collaborators include plastic substrate producer DuPont Teijin Films and electronic chip designer Solomon Systech, as well as Kent State University and the University of Akron. Specifically, the support from Ohio Third Frontier will enable the company to develop numerous Reflex electronic skin advancements, such as performance (optical, environmental, durability), size, conformability (complex shapes) and electronics (conductivity, miniaturization). The funding also will be used to refine and optimize the roll-to-roll production process.

Electronic skin technology offers brands and manufacturers new ways to personalize their products by controlling the surface color and even configuring icons and/or alphanumeric characters. A broader color gamut and fixed patterns will also be available as a result of the grant in addition to skins for laptops and electronic logos. Currently, the size of the skins is limited due to the size of Kent's web, but they are creating a bigger roll-to-roll process that will enable e-Skins on larger devices.

I think this technology is an enormous market changer. Today, the world of displays is primarily focused on beautiful, high-resolution, full-motion video targeted at a handful of consumer and information technology devices. The advent of single-pixel e-Skin technology shifts the world of displays to a much broader range of applications. In fact, almost any surface can be considered as being appropriate for an e-Skin. Not just cell phones and notebook PCs looking for a way to differentiate, but so many devices can benefit from such customization. Imagine the use of some advanced solutions so you can change the color of your car or the siding of your house! St. Patrick's Day – your house turns green; Valentine's Day it's red; and when the temperature is high, you can reflect the sun's heat with a silver color – or mid-winter you can attract heat with a black color.

My imagination isn't broad enough to anticipate the impact of e-Skin technologies – but I am quite certain this technology will change the world in ways we can only begin to imagine, perhaps more significant than the advances of the display industry as a whole in the past couple of decades…



Kent Display showed off their cholesteric liquid crystal technologies including electronics skins, a moldable, conformal display. The LCD layer measures about 4 microns on a thermoplastic substrate, which is much thicker. Kent showed off a mobile phone casing that could change between 8 different colors at the push of a button.

ASU's Flexible Display Center showed (on the left) the lamination of a flexible substrate to rigid carrier during processing. On the right is Fujitsu's e-Book which showcased color, 175ppi, on a plastic substrate, using stacked (RGB) cholesteric liquid crystal requiring several passes for full saturation.

LG Display showed a 3.0-inch transparent AMOLED (on the left), a 3.0-inch micro-thin AMOLED that measures only 0.42mm thick (center), and UDC showed a full-color, video-capable, flexible AMOLED (right).