

Commercialization of Microencapsulated Electrophoretic Displays

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Abstract

For decades, the pursuit of volume commercialization of low-power reflective displays with a paper-like look has been an unfulfilled dream. While steady technical progress was made throughout the late 1990s, there were still no volume products incorporating electronic paper displays (EPD) on the market. Now, microencapsulated electrophoretic display technology, also called electronic ink, has moved into volume production with a frontplane laminate (FPL) display component called E Ink Imaging Film™. This film is coated roll to roll on a flexible plastic substrate and integrated into a display module. Today, all-plastic segmented displays are being shipped as well as displays with electronic ink FPL being driven by glass TFT backplanes. A roadmap to active matrix flexible electrophoretic displays is being enabled by rapid technical progress on flexible TFT backplanes by a variety of companies. Each of the approaches to these backplanes and flexible active matrix displays has different advantages for the various market segments being pursued including large format flexible displays for e-news and other reader applications, rollable displays for compact readers, and high resolution small format displays up to 400 ppi that can have fully integrated drive electronics to reduce size and drive down costs. Backplane approaches include Si on plastic, organic transistors on plastic, and Si transistors on flexible stainless steel substrate.

Progress is also being made on next generation inks, including more reflective inks with higher contrast ratios. A full color 6 inch, 170 pixel per inch (PPI) active matrix display using a newer generation ink has been developed and this will be described and demonstrated. Large format segmented flexible displays will also be described.

KEY WORDS: E Ink, electrophoretic display, reflective displays, paper-like display, color electrophoretic display, stainless steel backplane, microencapsulated electronic ink, rollable display.