

Advances in Microencapsulated Electrophoretic Displays

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ABSTRACT

E Ink microencapsulated electrophoretic displays are now in volume production. Improved performance commercial electrophoretic films have been introduced, while at the same time even greater performance improvements have been demonstrated in the research laboratory.

Over the last 12 months, millions of units of display cells and E Ink imaging film have been shipped into a variety of products including cell phones, electronic readers, memory drives, and signs. The roll-to-roll manufacturing processes used have been proven to be quite appropriate for these high volume applications. E Ink Vizplex[®] Imaging Film has been introduced, a new generation of commercial E Ink electrophoretic ink with a 40% white state and a peak performance 240 ms address time.

In the research laboratory, the demonstration of an electrophoretic ink that can run at the near-video rates of 15-30 fps at ± 15 V has been accomplished. The images from these active matrix displays are completely stable even without power just as with the commercial E Ink displays. A full color electrophoretic display running movies and a computer windows type screen has been shown.

At the same time, ultra white inks approaching 50% white state with >15:1 contrast ratio have also been demonstrated on 6 inch glass displays. Such inks have yielded color displays with improved performance utilizing color filter arrays.

Recently, some remarkable advancements in flexible AMTFT backplanes announced by a number of companies including LG.Philips.LCD, Plastic Logic, Polymer Vision, Prime View International, Samsung Electronics, Seiko Epson, and Toppan have shown that the commercialization of the first flexible AM electrophoretic display products is practical and is nearing. These accomplishments range from "rollable" displays to flexible large format B&W and full color. The various technologies utilized each have strengths for specific applications. An update of the progress toward commercial flexible encapsulated electrophoretic displays will be reviewed.