21st Century Paper

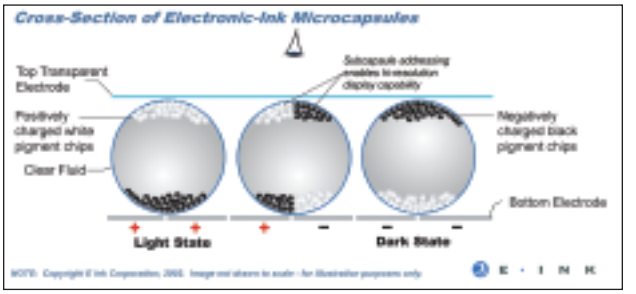
Due to be released later this spring, the Sony® Reader may take a significant step forward, improving a 2,000-year-old technology—paper. The most striking feature of the new book and document reader is its "screen." The E Ink® Imaging Film (also called e-paper) looks and acts a lot like its centuries-old progenitor usually squeezed from trees, weeds, or rags, but it's digital.

If a technology hasn't just survived two millennia, but has flourished in that time, you might wonder how you could possibly improve on it. Well, you could try to recreate all of its basic functions and then just remove any weaknesses. That's what the E Ink Corporation of Cambridge, Mass., tried to do.

Paper is civilization's primary depository for all kinds of information because it's cheap, easy to use, portable, reasonably durable, and requires only a single power source—sunlight by day, lamplight at night. How can you improve on that? Well, how about a sheet of paper that is endlessly reusable?

Older e-book readers, computers, PDAs, and now even cell phones all have screens that can be endlessly reloaded with new content. But none will ever compete with paper simply because they are backlit and paper isn't—it has a reflective surface. Paper is much more comfortable because it presents itself the same way other natural objects do—trees, mountains, and people aren't backlit.

When you turn a page on the Sony Reader, the power goes off as the new page comes up. You don't need any light source from the device because it has "printed" the content, and you now see it with the light reflecting off the page—just like paper. Microcapsules trapped beneath two layers of plastic film



create the same kind of dot pattern used in conventional printing. Each capsule can move its dark particles to the top surface (for a black dot), or submerge them (for a white dot). E Ink has a movie on its site that demonstrates the "printing" process—www.eink.com/technology/howitworks.html.

There are several manufacturers of e-paper, and the applications, realized and planned, are branching out fast. A watch with a paper face, advertising displays, price tags for store shelves, gauges on thumb drives that indicate full or empty, and, of course, readers. And mass-production of E Ink's color e-paper is expected at the end of this year. 2006 could be the year that permanent paper places its bookmark in history. ■

E Ink Corp.'s color prototype displaying, appropriately, a page from the Gutenberg Bible.

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