ITRI Introduces Rewritable, Reusable Electronic Paper Tech

HSINCHU, Taiwan, Oct. 10, 2011 – ITRI (Industrial Technology Research Institute), Taiwan's largest and one of the world's leading high-tech research and development institutions, introduces i2R e-Paper™, the first electronic paper technology to provide a re-writable, re-usable and environmentally friendly recyclable print medium – an "electronic paper" – to reduce traditional paper consumption. ITRI will receive a "2011 R&D 100 Award" from R&D Magazine next week for this breakthrough technology.

i2R e-Paper™ can be manufactured in a variety of sizes. It will limit waste on short-lived business initiatives such as advertising banners, corporate visitor ID badges, transit passes, and museum or parking lot tickets. In the future, the technology may be used for producing digital books and pictorials without restriction on length, wall banners, large size electronic bulletin boards and other innovative applications. It is highly flexible and bendable. Water solvent-based marker pens can be used to note, mark or draw on the flexible e-paper as it is typically done on paper computer printouts. The markers can then be washed off easily.

The e-paper's special green energy conserving display technology – a flexible cholesteric liquid crystal panel – is completely recyclable and requires only heat to store and transmit images, without using expensive inks. i2R e-Paper™ delivers a 300 dpi high-resolution image that remains crisp until users decide to re-use the e-paper. It is both eco-friendly and re-writable up to 260 times.

i2R e-Paper™, whether note card or banner roll size, does not consume electricity to maintain an image. To print and change content, users simply need a thermal printer fitted with a thermal head. Heat generated from the thermal head uses minimal power consumption and interacts with the environmentally friendly composition of the e-Paper to capture an image. Re-using the i2R e-Paper™ is as easy as putting it back into any thermal printer device. The old image is removed and replaced with a new one – no ink, no toner and no paper are consumed.

"It's a fact that a significant portion of daily office printed papers will be discarded in days or weeks after use," said Dr. Janglin Chen, general director of ITRI's Display Technology Center. "i2R e-Paper's re-cycle and re-use capabilities, positive effects on the environment and low cost of production are paving the way for mass acceptance of green e-paper technologies."

ITRI's patented cholesteric liquid crystal technology is not the same cholesterol generally referred to in the biomedical industry, but rather has a structure similar to cholesterol molecules. Cholesteric liquid crystal is a reflective display technology. It utilizes ambient light sources from the external environment to display images, does not require any backlighting and doesn't consume power in maintaining the

display of content or diagrams. The cholesteric liquid crystal can produce red, green and blue colors by adding different pitch spherical composite ion-exchangers to produce different colors. It is also one of the future display materials for color e-books.

Currently, ITRI is licensing and transferring the i2R e-Paper technology to manufacturers for their production of consumer e-paper and the corresponding thermal writer machines. Recently, ITRI completed an industry science and technology program with four material manufacturers and five equipment operators, and the technology has also been transferred to one of Taiwan's top chemical engineering manufacturers for trial mass production. Production costs for i2R e-Paper is low and easy to carry out, and as additional license agreements are pursued, ITRI's i2R e-Paper developers are continuing to develop its e-paper ecology to the point where the technology can be rewritten hundreds of times beyond the current 260.

ITRI has applied for 17 patents for i2R e-Paper, eight of which have been granted. ITRI is in the process of licensing the technology in Taiwan and is currently in talks with U.S. companies as well. Interested companies can contact ITRI at 1-408-428-9988 or 0800@itri.org.tw [1] for more information.

ITRI, headquartered in Taiwan, has offices in the United States, Japan, Russia and Germany in an effort to extend its R&D scope and promote opportunities for international cooperation. In the U.S., it has long-term collaborative arrangements with MIT, Carnegie Mellon University, the University of California at Berkeley and Stanford University. Globally, it has 23 international cooperations with major companies such as IBM, HP, Microsoft, Nokia, Sun Microsystems, Kodak, Lucent and Motorola.

To date, ITRI holds more than 14,571 patents and has assisted in the creation of more than 163 start-ups and spin-offs. In 2011, the institute received four prestigious international awards: The Excellent Organization, Solar Industry Awards in UK for Solar Radome, two R&D 100 Awards for i2R e-Paper and HyTAC and the Silver Award for The Society for Information Display (SID) Display of the Year Awards (DYA) for ITRI Flexible Substrate for Displays. In 2010, the institute received five prestigious international awards: The Overall Gold Wall Street Journal Technology Innovation Award for its FlexUPD technology, runner-up in the Semiconductor category for its MDPS (Micro-Deformable Piezoresistive Sensor Technology) and three R&D 100 Awards for FlexUPD, i2/3DW and Reddex. In 2009, the institute also received four prestigious international awards: The Wall Street Journal's 2009 Technology Innovation Award for its FleXpeaker technology, an R&D 100 Award for the High Safety STOBA Lithium Battery Material Technology, the iF Design Award from the International Forum Design in Germany for ITRA's Fluid Driven Lighting System, and the Red Dot Design Award by the Design Zentrum Nordrhein Westfalen in Essen, Germany, for its Flexio Radio Technology.

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