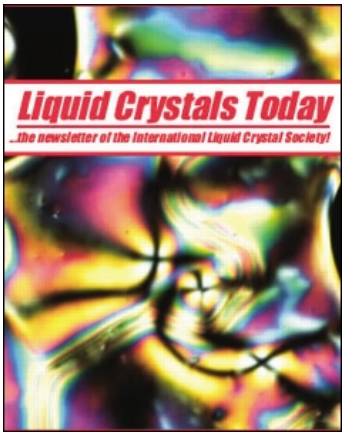

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COMPANY NEWS

Roche Launches ROLIC LTD to bring revolutionary new LIQUID CRYSTAL TECHNOLOGIES for Imaging and Displays to Market

Rolic Ltd, a recently launched liquid crystal R&D company from Roche, has announced the development of several new path-forging technologies which are expected to have a major impact on the liquid crystal display (LCD) and copy-proof security industries in the future. Rolic's inventions solve many of the challenges facing the LCD industry, such as view angle dependency, high cost and response time. They represent a quantum leap in making high resolution, large area displays possible. Rolic will make essential contributions to the development of refined, ultra high resolution image and display products. Rolic's future products will enable visual computing professionals as well as the general public to work more effectively with a greater variety of new-age information displays than ever before.

Rolic is a spin-off of Roche Liquid Crystals, having over 25 years of experience as a leader in the liquid crystal device development and chemical business. The researchers of Rolic are internationally leading scientists. Dr Schadt, CEO of Rolic, together with Dr Helfrich of Roche's central research unit invented in 1970 the twisted nematic effect on which today's liquid crystal display (LCD) industry is based. Rolic approaches research in an unique way, combining not only device research but also device-specific chemical research which makes electro-optical devices operable, allowing faster development of product prototypes. Many of the patents from this group of scientists form the basis for the rapid development of the liquid crystal display industry around the world. Rolic's scientists have done extensive research in applications related to current and future electro-optical technology and have achieved more than 70 basic patent series as the basis for new products to be brought to market. These patents cover both new devices and the necessary chemicals to make the devices commercially available.

Rolic is now embarking on an aggressive build-up of new technologies and applications for the next generations of liquid crystal displays and related optical devices. These applications will become available in portable and personal computers, large flat panel television screens, military, aviation, navigational, medical and other display applications.

Technologies

Linearly photopolymerizable polymers (LPP)
One of the exciting new Rolic inventions is LPP technology which improves the yield of liquid crystal display manufacturing by replacing the mechanical liquid crystal aligning process used today with optical alignment. The photographic LPP alignment process is faster and less capital intensive than the current mechanical brushing procedure. LPP technology will contribute to reducing the manufacturing costs of all types of liquid crystal displays. Moreover, LPP technology also solves the problem of view angle dependency of present LCDs by creating photograph-quality images from every angle. The technology also creates complex copy-proof images which are invisible under normal lighting conditions. LPP copy-proof images are only readable when viewed through a polarizer. The information content of LPP images is superior to that of present hologram technology. Finally, LPP inventions represent a major breakthrough in rendering economical stereo and three-dimensional LCDs feasible with applications in numerous professional fields from molecular modelling to aerospace and defense.

Deformed helix ferroelectric (DHF)) LCDs: fast responding displays similar to prints
The DHF liquid crystal display patented by Rolic solves two major problems of the current liquid crystal display industry: limited field of view and sluggish response times at low temperature which restrict video LCD applications. These current LCD technical limitations are especially apparent in flat panel televisions and outdoor applications such as navigation systems. Rolic's DHF displays generate angular independent images similar to prints plus response times that are about one hundred times faster than the current thin film transistor (TFT) TN LCD technology. Full colour images can be displayed with DHF LCDs making high definition flat panel large area television possible when combined with plasma addressing. Leading electronics companies in collaboration with Rolic have demonstrated the video compatibility of DHF LCDs. Rolic has recently solved the technical challenge related to the very narrow cell gap of DHF LCDs, now making the technology compatible with the current cell gaps used for TFT LCDs.

With increasing trends towards large flat panel technologies, Rolic's ability through DHF to combine plasma and liquid crystal technology in complementary ways will have a significant impact on future high definition large flat panel displays. Rolic's DHF technology will make it possible to bring economical flat panel, large screen high definition television more rapidly to the market.

Novel LCD video projectors with compact cholesteric liquid crystal optics
Another major breakthrough is Rolic's development of cholesteric LCD projector technology which will revolutionize the projection industry with small, lightweight devices that are capable of projecting bright colour video images onto large screens. Current LCD video projectors are rather dim, require powerful lamps and are bulky. Rolic's patented cholesteric LCD projection technology uses stacked, non-light absorbing colour filters with integrated LCD light modulators in single beam configuration. This structure allows the projectors to be highly compact, have reduced energy consumption and increased brightness and image quality.

Integrated nonlinear optics (NLO): the fast lane on the information highway
Rolic's NLO devices will contribute to the developing information 'super highway' through integrating optical elements, such as waveguides and modulations, neatly with solid-state lasers and driving electronics.

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