Coating Materials News

Volume 23 Issue 3, July 2013

Inorganic Chemicals & Specialty Thin Film Coating Materials

Display Technology - Materials and Techniques

Advances to Meet Demanding Requirements

Display technology is an evolving field. On-going development by laboratories and companies is advancing the technology worldwide to meet more demanding requirements. Key properties driving these improvements include a high degree of color saturation, high black-to-white contrast and high spatial resolution. Familiar technologies used in today's common displays include LCD, LED, OLED and their hybrids. Future goals include achieving lower power and higher contrast in thin flexible formats. Also desirable is the ability to operate in high ambient lighting conditions which requires specific architecture. Currently, imaging displays range in size and application from cell phone-sized electronics to theater screens, video walls, and billboard-scale advertising panels. Following are some development highlights of display technology.

Phosphor Pixels

Some newer technologies include employing colored solid state diode lasers whose beams are scanned to compose individual RGB pixels. Individual LED RGB pixel arrays compose another display technology. One example of the latest technology [1] is Phosphor pixels that are stimulated by a 405 nm laser diode to emit RGB colors to produce images. The Phosphor pixels grouped as RGB triplets are currently made from powders incorporated as paints. The development of film-layer replacement materials are intended to improve color saturation, contrast and resolution properties.

Electrophoretic Displays

Among the evolving display technologies is a promising form based on electrophoresis. Electrophoretic displays involve the transport of charged particles, such as ions or microspheres, between two oppositely charged transparent electrodes. The separation of charges can be engineered to produce a medium that can display color and contrast changes in text or images. The medium can be made very thin as, for example, with "e-paper", electronic ink and "smart paper."

The field of electrophoretic image reproduction is relatively recent, and new materials

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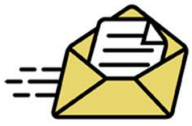

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are being investigated and applied in a variety of approaches. Electrophoretic display types include sub-classes defined by materials and pixel-addressing processes. Electrochromic display operation uses the change in the ion environment to modify the optical properties of an ion-supplying liquid. As voltage is applied through the liquid layer between transparent electrodes, mobile ions cause a thin film layer of Tungsten Trioxide (WO3), for example, to reflect or transmit. The transparency of a window can thus be controlled by changing the applied voltage.To read the full technical paper, click on Display Technology.

Role of Silver in Modern Display Technology

Advantages Over Other Materials

From computers to televisions to smart phones, displays impact how we view information on a daily basis. There is a pool of diverse technologies to choose from that enable certain displays for a given application. Among these are Organic Light Emitting Diodes (OLED) and its adjoining technology, Active Matrix OLED (AMOLED), which is gaining a bigger role in the market. Materion Advanced Chemicals produces specialty materials, like high purity silver, to support these technologies.

AMOLED Technology Growing

While it may still be an emerging technology, particularly compared to that of dominant Liquid Crystal Display (LCD), experts see merit in pursuing AMOLED for its unique advantages. Among these are its wider color range, quicker response time, and higher operating temperature range. AMOLED critics however, would cite LCD devices' longer lifetime and lower production costs as detractors. Nonetheless, it is evident that AMOLED technology has the opportunity to transcend its current position in the display market.

As commercialization of AMOLED technology rises, a variety of key materials have been considered along its course of development. Certain requirements must be met in order to ensure AMOLED quality and performance. These include: using anode materials with a high degree of adhesion; employing high performance reflecting materials to direct light to the backside of the device; and adopting appropriate emitters needed to maintain high intensity. There is a range of materials that can be examined for these different applications. That list would contain such metals as Chromium, Titanium, Gold and Copper. However, leading the pack would be silver.

Silver Advantages for Display Applications

Among candidates commercially available, silver has proven to have very high reflectance and high emitter intensity - qualities deemed necessary for superior performance. Silver in these roles can also reduce power consumption of battery-powered devices. To read more, click on Role of Silver in Modern Displays.

Customer Survey Coming Soon!

Net Promoter Study Needs Your Input

Face to Face ...around Materion

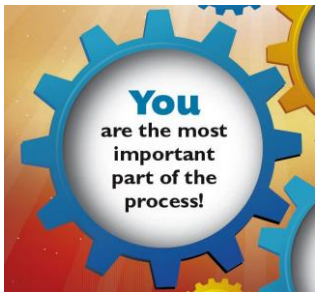
Jim Paloucek

Materion Advanced Chemicals would like you to meet Product Manager James Paloucek, a twenty year company employee. Jim works in our Milwaukee site and reports to EJ Strother, VP and SBU leader.

Jim is mainly responsible for Advanced Chemical's alternative energy materials product line.

Jim attended Marquette University where he earned two Bachelor degrees. Over his career, he has enjoyed working on a wide range of projects, commenting that "I always consider the most interesting project to be either the current project I am working on or the next project on the horizon." However, looking back, one of his more memorable projects was the one surrounding the space shuttle's boron silicide tile material.

Outside of work, Jim is enjoys outdoor sports that include cycling and downhill skiing. At work, he feels his job is kept interesting every day by



Materion will soon be conducting its annual Net Promoter customer survey via email. We would greatly appreciate a few moments of your time to respond. Your input assists in our continuous improvement and ultimately enhances our service to you.

the wide variety of materials and applications of Materion Advanced Chemicals, along with the variety of customers and co-workers he learns from and works with daily.

Materion Advanced Chemicals...
Evolving through technical innovation.

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