

## 3M Demonstrates Innovative Display Film Solutions During SID Display Week 2011

Taking energy efficiency in electronic devices a step further, the 3M Optical Systems Division today provided a sneak preview of its energy efficiency exhibit highlights that will be featured during SID Display Week 2011, to be held May 16-20 in Los Angeles, Calif. Demonstrating how the company's films make today's electronic devices more efficient, without sacrificing display performance, 3M will showcase its latest energy efficiency films for tablets, handheld devices, notebooks, monitors and LCD TVs. In addition, the company will debut several new demonstrations including its proprietary integrated optics technology, uniformity tape and 3D handheld displays using collimated films, with and without glasses. The company's energy efficient solutions can improve energy efficiency in electronic devices by up to 30 percent.

"The display and electronics supply chain is continuously reinventing electronic devices," noted Jim Bauman, vice president of 3M's Optical Systems Division. "Our optical films, and unique technology solutions enable display and device manufacturers to create thin, bright and energy efficient electronic devices, with endless possibilities. The demonstrations at our booth provide a sneak preview as to what the future holds for display-centric electronics, made possible by 3M's technology innovation."

During Display Week, 3M will show the following:

### **Uniformity Tape Allows LCD Manufacturers to Reduce Number of LEDs Required for Edge-lit LED LCD Panels at a Low Cost without Sacrificing Brightness or Efficiency**

3M's Uniformity Tape is a clear tape, which has adhesive on one side and a micro-replicated optical pattern on the other side. It is adhered to the edge of the light guide, which faces the LED light sources. The tape is designed to increase the spreading of light in the light guide from each LED, which greatly increases the allowable LED spacing. The optical pattern is spatially uniform, meaning that no positional registration of LEDs is required along its length. The Uniformity Tape keeps the edge of the display closest to the LEDs uniform in brightness when the spacing of light sources is increased. This allows panel manufacturers to save money by removing unnecessary LEDs. Uniformity Tape can also increase LED spacing by up to three times the current spacing, while maintaining edge uniformity for a given bezel size.

### **3M's Collimating Multi-layer Optical Film, Air Guide and Unique 'Light Mixing' Approach Enables Non-incremental Improvements in Cost and Simplifies LCD/System Supply Chains**

3M's new class of integrated optical films, known as 'Collimating Multi-layer Optical Film' (CMOF), can eliminate all free-floating films, as well as the light guide from

LED LCD backlights. The continued use of the traditional, multi-film backlight architecture has resulted in constraints that limit innovation in cost, performance, form factor, weight and the supply chain. 3M's 'integrated optics' approach leveraging CMOF and Air Guide technologies addresses these challenges head on—significantly improving the overall environmental profile of these systems and presenting a rare opportunity for collaboration across the supply chain.

### **Glasses Free 3D Films Deliver True Auto-stereoscopic 3D without Impacting Display Color or Resolution**

3M's latest advances in 3D Enhancement Films include a handheld auto-stereoscopic device demonstration with full resolution 3D and full resolution 2D viewing off-axis and no view reversal. In addition, the company will show its new, 9-inch auto-stereoscopic tablet displays, also featuring full resolution 3D and 2D, with no view reversal, as well as a 400mm viewing distance by leveraging 3M's advanced 3D Enhancement Film.

### **3M Tablet Film Increases Battery Life, Reduces Device Thickness and Weight, Without Sacrificing Display Brightness or Quality**

3M's tablet demonstration will leverage four key optical films: APF-V3, an extremely thin, 26 micron, high brightness reflective polarizer; LBR-160, a high efficiency back reflector; as well as BEF4-GMv2 and BEF4-GT, thin, high brightness, Brightness Enhancement Films (BEF). By combining the films, tablet battery life can be extended without sacrificing display quality or brightness. This one of a kind film combination can also be used to increase display brightness by more than 50 percent, enhancing the outdoor viewing experience, in addition to reducing the overall thickness of backlight films by 30 percent\*.

### **Front Light Display Technology for e-Paper Displays Gives Uniform, Energy Efficient Lighting**

3M's new front light display technology provides highly uniform and energy efficient lighting for e-paper displays, while maintaining image quality and thin form factor. The technology creates a display that has all the advantages of e-paper displays in bright and normal lighting and still can be used conveniently and comfortably in dark environments.

### **Leveraging 3M's Light Enhancing Films To Enable Energy Savings Without Compromises**

This series of demonstrations depicts the innovation that 3M has and is continuing to deliver to the LCD backlight industry. From the current industry standard utilizing 3M's Dual Brightness Enhancement Film (DBEF) to the future where all that is needed is a back reflector and a new 3M multi-function reflective polarizer that is integrated with the panel, 3M has and will continue to deliver energy saving solutions without any compromises.

### **Wider Viewing Angles without Sacrificing Brightness**

This unique exhibit highlights high-brightness, wide viewing angles and unparalleled picture quality from all directions that are made possible by the benefits of the company's DBEF solution.

### **Extended Battery Life (EBL) for Mobile Devices**

3M will demonstrate backlight solutions that improve the efficiency of mobile displays and devices—enabling higher brightness and/or longer battery life in high use-modes. Paired comparisons of cell phones running 3M's Display Monitor Application will demonstrate the improvements in estimated display-on, gaming, movie and Wi-Fi browsing battery life by optimizing the display using 3M's backlight solutions.

### **Advanced Structure Optical Composite (ASOC) Makes Thinner Mobile Displays Possible**

3M will show prototypes of its 97 micron Advanced Structure Optical Composite (ASOC) film, which will be 3M's thinnest backlight stack film solution for mobile displays while meeting current crossed prismatic film brightness performance and robustness.

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