

3M Ushers in a New Era of Light Management with a New Class of Integrated Optical Films

Company'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

Advancing light management for LCD backlights, 3M's Optical Systems Division today unveiled a unique solution to address long-standing constraints in LCD backlights. Specifically, the company'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.

"Technology advancements in LEDs have led to exciting developments, such as edge-lit LED LCD TVs," noted John Wheatley, Division Scientist for 3M's Optical Systems Division. "Despite this, 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. Our '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."

Collimating Multi-layer Optical Film "CMOF" Solution Enables Unique "Light Mixing" Approach

CMOF is based on 3M's multi-layer optical film technology platform that is used to make current display films such as DBEF reflective polarizers and ESR reflector films. By leveraging CMOF, 3M has demonstrated how to reduce the amount of light management material in an LED LCD backlight by an order of magnitude—significantly improving the overall environmental profile, while enabling non-incremental improvements in cost, as well as the simplicity of products, display systems and supply chain. The company's 'integrated optics' solution also enables a unique, new light management approach, consisting of 'light mixing' to address fundamental problems to LED displays. As a result of this technology, 3M has developed a new backlight architecture called Air Guide.

Integrated Optics On-Panel: Air Guide

3M's ability to integrate the light management directly on the panel in the manufacturing process enables a one-step assembly process—making the supply chain even more efficient. Device manufacturers who use LCD panels with 3M optics integrated, can simply place it on the appropriate chassis, made with an integrated ESR reflector. In addition, by leveraging Air Guide, LCD manufacturers will have display systems that are more tolerant to LED binning variations of brightness and color associated with LED manufacturing. This is important since costs associated with binning can account for up to 30% of overall LED manufacturing costs. Monitor, TV, and LCD signage are all potential markets for Air Guide.

"The continuous improvement in LED output and efficiency has created a situation where many displays are now at or will soon approach their uniformity limit. This means that even if LEDs continue to improve, a system cannot use fewer lamps, since it would result in non-uniformity due to the widely spaced points of light," Wheatley added. "Light mixing changes this, enabling systems with very few, widely spaced LEDs. In fact, a monitor illuminated with a single LED, or a TV with 5 LEDs is not out of the question in the near term."

Carbon footprint is of increasing importance in assessing environmental impact of products. Carbon footprint includes not only energy efficiency of device power draw, but also the impact of the entire supply chain in making, shipping and packaging required for a device's manufacture. 3M works with its customers to find ways to continually improve in this area, and integrated optics for LCD is an important part of that effort.

Open Cell Business Model

Lastly, the industry is increasingly moving toward adopting an open cell business model where panel makers will make openly available LCD panels for purchase. 3M's ability to integrate the light management directly on the panel in its manufacture is well suited to this, and results in an even more efficient supply chain. Device manufacturers would just need to purchase a panel (with 3M optics integrated), and place it on the appropriate chassis.

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Note to Editors: Photos Available Upon Request

Media interested in seeing 3M's integrated optics demonstration, as well as 3M's full suite Optical Films for handhelds, notebooks, tablets, monitors and LCD TVs should visit Booth #807 at SID Display Week or contact Stacey Voorhees-Harmon at stacey@savvypublicrelations.net or 925-336-9592 to schedule a briefing during the show.

About 3M

A recognized leader in research and development, 3M produces thousands of innovative products for dozens of diverse markets. 3M's core strength is applying its more than 40 distinct technology platforms - often in combination - to a wide array of customer needs. With \$25 billion in sales, 3M employs 75,000 people worldwide and has operations in more than 60 countries.

Photos/Multimedia Gallery Available: <http://www.businesswire.com/cgi-bin/mmg.cgi?eid=6721387&lang=en>

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