# SHEDDING LIGHT ON THE AUTOMOTIVE LIGHTING MARKET:

## TECHNOLOGY TRENDS & REGULATIONS



Advanced Lighting for Automotive

MAY 21 - 23, 2018 | DETROIT, MI

## Ahead of the upcoming Advanced Lighting for Automotive Summit this May in Detroit, we took a look at the latest automotive technology trends.

The automotive industry is in a transformational stage in terms of lighting, with several new technologies coming to the market that offer improved performance, safety and aesthetics. This eBook looks at the latest trends in automotive lighting and highlights which technologies are not permitted in the United States.

Recent developments within automotive lighting have successfully increased safety standards across the board. As there is a higher risk for driving accidents at night, innovation within vehicle lighting is increasingly important for safety. In the future, car headlights could automatically highlight pedestrians and other vulnerable road users to drivers, and even project crossings and warning signs on the road to help reduce accidents.






*Image source: BMW*

# LASER

**Today's headlamps are often bulky, multi-chamber assemblies that take up large portions of a car or truck's front end. Lasers are replacing these units with tiny modules that perform better while consuming less electricity.**

The lights are more energy-efficient, and some researchers say laser light technology is the next step in lighting after LEDs. Laser headlights provide focused long-range beams that can double the reach of normal high beams, focusing a beam up to 2,000 feet, all without sacrificing electrical efficiency or design simplicity.

Laser lights can be identified by their blue light signature, and they greatly enhance visibility for the driver by projecting a low and wide beam of light on the road ahead. A laser hits a fluorescent phosphorus substance inside the headlight to create a beam of extremely bright white light that is 10 times more intense than conventional sources, while boosting energy efficiency by 30 percent above LEDs.

Laser headlights are already offered in Europe on select models from Audi and BMW but aren't yet legal in the United States.



*Image source: AUDI*

# MATRIX

**The "Matrix Laser" system does everything from highlighting pedestrians to auto-dimming for the sake of oncoming cars.** This technology, which debuted as part of Audi's Q8 concept SUV, is the latest push to reinvent the way drivers see the road around them. The technology also makes it possible to display images on the road, just like a projector.

According to Volker Kaese, Audi's Director of Innovation, each headlight uses a single laser as the light source, but the beam is broken into a million distinct pixels by the diodes. A small mirror continuously aims the beam to different sections of the matrix to adjust its projection- high or low, wide or narrow, and anywhere in between.  Using a Digital Micromirror Device, a multitude of individual lights are switched on and off to effectively "shadow" oncoming cars and pedestrians from headlight glare.

These lights are not legal in the U.S., as regulations require vehicles to have high beams and low beams.



*Image source: Mercedes-Benz*

# LED ADAPTIVE

**Adaptive LED systems use a matrix of individual LEDs that automatically turn on and off based on where the car is headed and other vehicles that the system detects on the road.** That provides high-beamlike optimum illumination while not blinding oncoming drivers. LED adaptive headlights turn on their beams around each bend in the road, giving a better view of what's ahead.

The Insurance Institute for Highway Safety estimates that adaptive headlights could help prevent up to 90 percent of nighttime curve crashes.

Insurance companies have also seen a 5 to 10 percent reduction in automobile crashes with LED adaptive lighting.

Adaptive headlights aren't yet standard equipment on most cars but Lexus, Audi, BMW, Renault and many other high-end manufacturers offer adaptive headlight packages in Europe. But don't run down to a dealer looking for them; they're not yet legal in the United States.

# OLED

**Organic LEDs, are thinner than old-fashioned LEDs - composed of extremely thin organic layers to achieve a final thickness of only a few hundred nanometers.** The incredibly thin layer is less than 1000/1th the thickness of a strand of hair. The result is a panel whose thickness is almost entirely unaffected by the luminescent material.

Exploited to date mainly on the rear lights - and on an experimental basis - this technology tends to make the lighting more interactive. Thin and easily formable, OLEDs take up less space than LEDs and can be subdivided into many small segments, controllable to effectively act as individual light sources with different brightness levels.

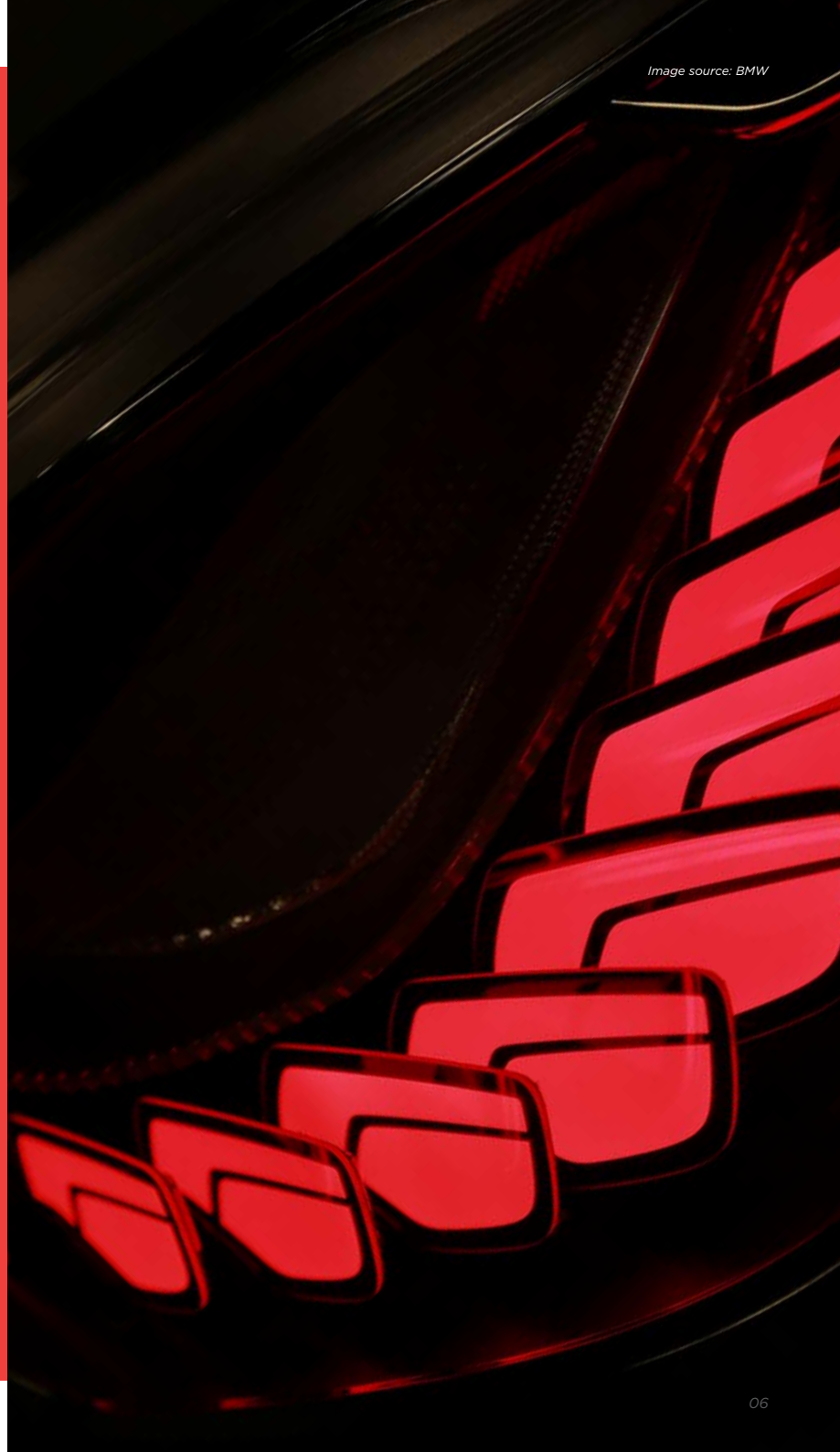


*Image source: BMW*

Advanced Lighting for Automotive

## Interested in learning about the upcoming Advanced Lighting for Automotive Summit?

**Join us May 21st – 23rd in Detroit, MI**

## Applications Across The Spectrum: Safety, Functionality & Design

*Reasons to Attend:*

- Hear from leading lighting researchers and programs at universities
- Collaborate with fellow industry thought leaders to discuss latest innovations in advanced automotive lighting that will allow your company to meet U.S. and global regulatory standards while also producing high-performance vehicles that meet consumer demands for luxury style
- In depth evaluations of LED, OLED, and lasers: the benefits, challenges and current uses
- Deepen your understanding of how innovations in advanced lighting systems will allow OEMs to reduce vehicle weight, thus improving fuel efficiency
- Great networking opportunities with leading figures in lighting technology from both OEMs and Tier 1 companies



*For more information:*

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