Tue, 7 May 2024
Weekly Newsletter

DVN Lighting

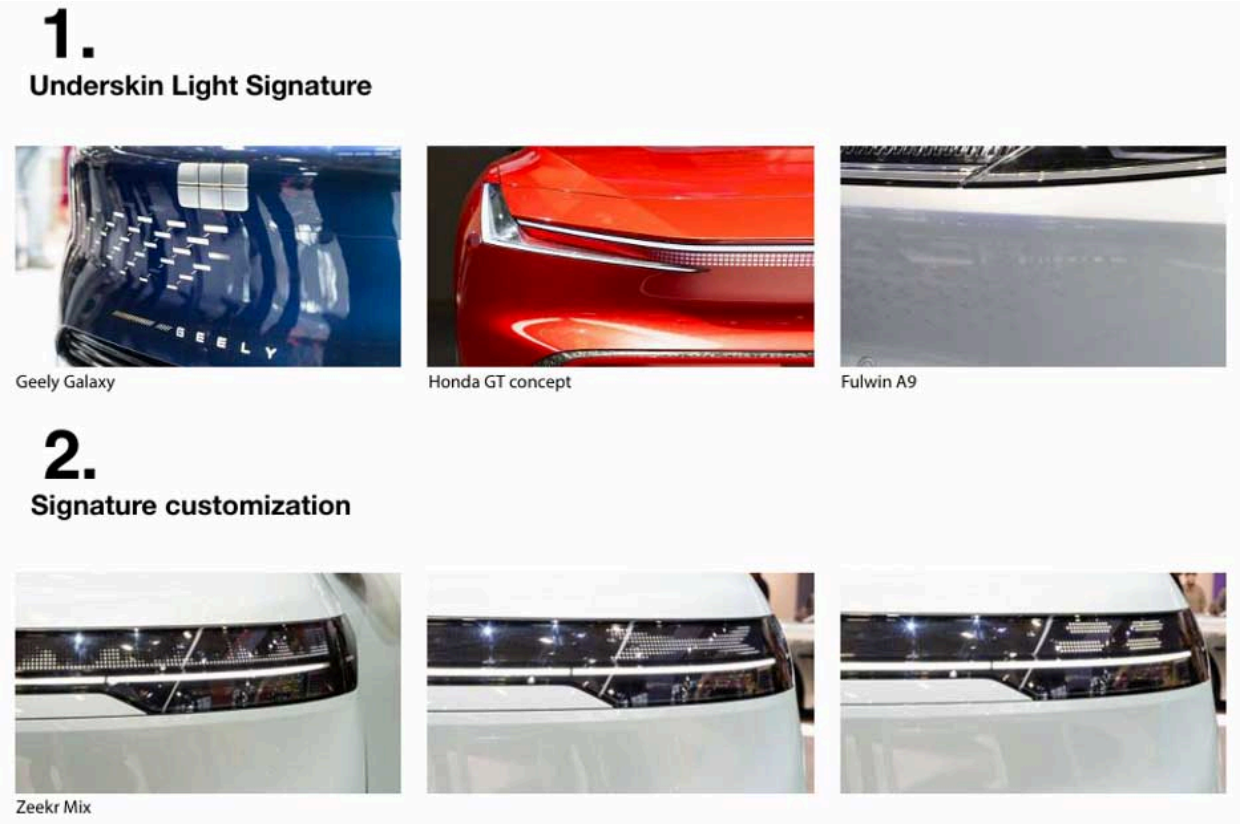
NEWSLETTER #854

Editorial

Beijing Autoshow DVN Report Goes Live

We have just released our detailed Beijing Autoshow report about the new vehicles presented last week. This event was the biggest event of 2024 for our automotive industry, with all the new trends that are coming for the future, especially for BEVs.

Four key takeaways are all about exterior lighting design. Lighting was a primary main focus of the event; most of the new BEVs have similar shapes and designs, and so lighting is the most often, most prominent differentiator.



3.
Messages and safety

Changang Qiyuan E07

DongFeng Truck

Nio ET9

4.
Ultra refinement inspired by jewelry

BYD YangWang U8

Hongqi Golden Sunflower

Stelato S9

In addition to the report, Wolfgang Huhn shares his impressions from the show, through his expert eyes.

Sincerely yours,

Paul-Henri Matha
DVN Chief Operating Officer and Lighting General Editor

In Depth Lighting Technology

Beijing Motor Show: Behind the Scenes

Greetings to DVN from Renault CEO Luca di Meo

By Wolfgang Huhn

My main takeaways from the Beijing Motorshow 2024:

Cell phone manufacturers are becoming automakers. They are counted on the stock exchange as high-tech, not as car manufacturers (like Tesla). The cell phone companies take care of the electronics platform, including the all-important infotainment, as well as the batteries and all the software. They also handle the sales in their flagship stores. Building the cars is contracted out to a car company. A super dangerous trend for the traditional car manufacturers.

Huawei's Aito cars are manufactured by Seres. The electronic platform and software are by Huawei. One supplier per car for all lighting equipment: Anrui for the M5; Liaowang for the M7, and Xingyu for the M9 (with Huawei HD module).

Xiaomi was the biggest crowd-draw, with long lines to enter the booth. CEO Lei Jun is as popular in China as Elon Musk. Both Tesla's and Xiaomi's designs look a bit like Porsche.

The only NEV (new energy vehicle) brands making a profit in China are BYD and Li Auto. Consolidation of the market is coming soon. The cost pressure on suppliers is huge and will increase.

'Influencers' were everywhere! Hundreds of young people, mostly female, posting and streaming to their followers about the auto trends.

Some lighting and lidar suppliers had private booths or parts of huge supplier tents next to the automaker halls—Appotronics, Marelli, Robosense, and Valeo, for example. Most of the suppliers were located 20 km away in a separate part of the exhibition. It was said that in the future both parts will be reintegrated.

Best Lighting supplier booth: Valeo with a booth like at the CES

In line with Valeo's usual practice, no photos were allowed inside the booth as the components on display were for customers only. Many illuminated logos in different technologies, microLED applications, and rear lamp samples with surprising effects were shown. The main technology presented on the stand was ADAS.

Appotronics showcased a van with a roll-board on which a laser projector projects high-brightness movies. The roll-board disappears into the roof when not in use. Another feature was a laser projection on the sunroof with spectacular effects. Both products will soon be used in production cars.

In a 20m light tunnel, Appotronics showed an all-in-one RGB laser projector for exterior lighting. Low, high, and HD beams are possible, as well as projections for driver assistance on the road. A laser projection grilleboard and a laser HUD were also shown, as well as a 3D animation.

DVN's W. Huhn with Appotronics' Han, Yu, & Chen (L); Appotronics' sunroof laser projection (R)

The Marelli booth was located next to Italdesign and Valeo. It, too, was only for customers; CEO Frank Huber gave DVN special permission to take photos of two of the many systems on display.

D. Thalgott, W. Huhn, F. Huber (L) · Lidar integrated in lamp (M) · Near-field ground projection in microLED headlamp (R)

Forvia Hella didn't have a booth, but they were networking everywhere because their local sales director Honqin Zhou knows absolutely everyone.

DVN's W. Huhn with Hella EVP Didier Keskas & Saes Director Honqin Zhou

Porsche booth in the year of the dragon (L) · Jidu Auto booth (M) · Jetta is a brand in China, for FAW VW's budget cars (R)

Lighting News

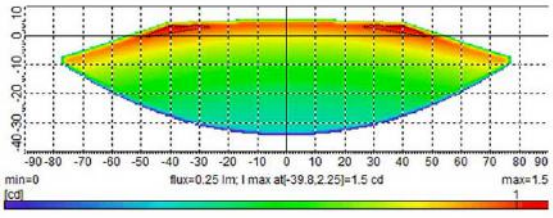
Creat, THN-Ohm on Factors in Licence Plate Light R&D Simulation

LIGHTING NEWS

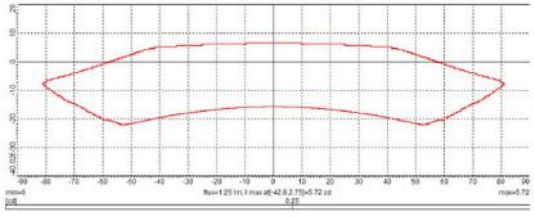
Daniel Karg, Alexander von Hoffmann, Matthias Groß, and Yasen Yakimov from the Technische Hochschule Nürnberg Georg Simon Ohm have a new **paper** about photometric criteria to take into account for the design of registration plates. The work was carried out at automotive engineering-services company **Creat**, in Ingolstadt.

While plate lights usually don't get marquee billing, they're an important part of a vehicle's lighting system. Illumination of registration plates poses its own unique technical challenges.

For the study, different cars were used to note the positions of their registration plate, and a simulation done for the ideal distribution as seen below on the left. It was then optimized for a greater flexibility as seen below on the right with the distribution of luminous intensity enlarged vertically and horizontally, allowing more installation positions of the lamps in relation to the registration plate.



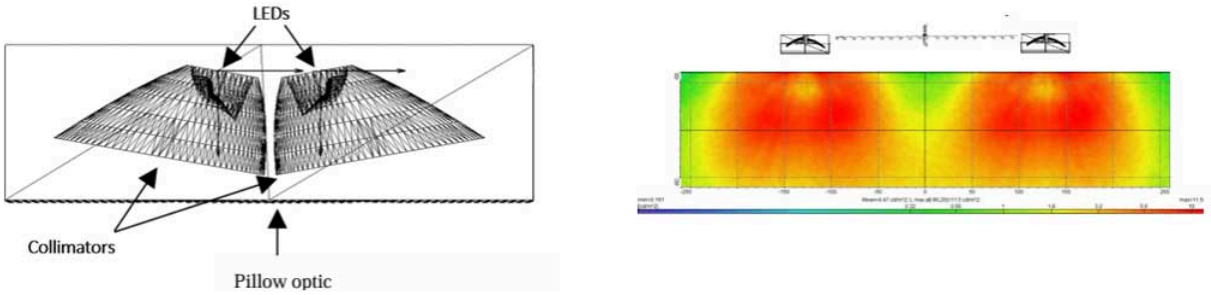
Reverse simulated Reverse simulated luminous ideal intensity distribution of one registration plate lamp



Optimal theoretical Light intensity distribution using overlayed LID files of the measured vehicles

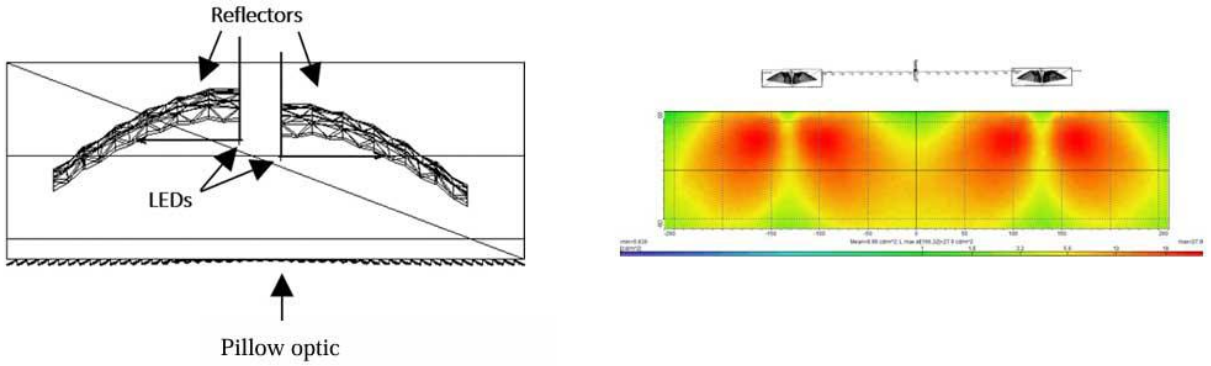
Two of the variants studied meet UN R4 requirements—the collimator and the reflector, each with a pillow optic as a scattering element. Two other variants, an LED with pillow optics and a Fresnel lens with pillow optics, do not meet the requirements.

The collimator setup uses two 1-lumen LED lamps. This generate an average luminance value of 8.99 cd/m^2 and a maximum luminance of 27.9 cd/m^2, fulfilling UN R4. However, for a better margin of 276 per cent, they are proposing to use 2-lumen LEDs instead.



Two collimators tilted outwards by 10° (L) and the distribution with two lamps (R)

Another analysed solution uses a lamp with two reflectors, each with a 1-lumen LED, and a pillow-optic scattering element in pillow optic. Two lamps are used for better homogeneity.



Lamp with 2 reflectors (L), light distribution with two lamps (R)

The circuit board is fitted with one LED on each side and positioned in the middle of the casing. The opposing LEDs must be offset on the circuit board due to the design. The reflectors are also rotated by ±90° in Y-direction to save space. Each lamp emits a luminous flux of 0.84 lm from the two 1-lumen LEDs, with an average luminance value of 4.47 cd/m^2 and a maximum value of 11.5 cd/m^2—not enough to meet the regulation, but that becomes possible with 3-lumen LEDs instead of 1-lumen items.

An experiment was also done comparing different materials like PMMA, PC and silicone, each with a different refraction index. PC with its higher refractive index degraded the homogeneity, while silicone with a lower refractive index gave the best results.

Conclusion: The geometric relationship between the light and the registration plate varies for different vehicles. The differences between the various vehicle classes are particularly big. For this reason, a registration plate lamp must be flexible in use. This can be achieved by widening the light cone with the optics. A wider light cone opens many possibilities for positioning the lights on the vehicle to comply with the UNECE R4 standard. However, shifts from the originally planned position are associated with a loss of homogeneity.

Plastic Films in Mobility

LIGHTING NEWS

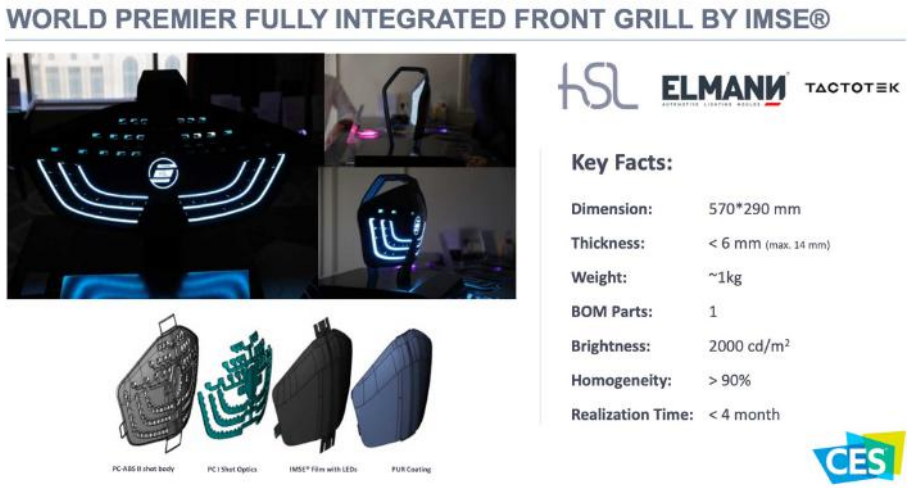
Around 200 people gathered in Würzburg, Germany, at the Plastic Films in Mobility conference on 23-24 April to talk about the design and technology trends in automotive interior and exterior applications.

The conference chair committee put a diverse panel together which covered the entire value chain, from film production, the associated printing and film forming technologies, film injection molding technologies, and the system integration process. The structural changes of digitalization trends and associated lighting signatures gives new impulses to different film applications and a new coöperative approach to find suitable solutions for different challenges for large decorative and illuminated parts for exterior applications.

Active participants included tier-1 suppliers like HSL and Rehau/ZKW; tier-2 suppliers including Kurz, Kyomoto, and Nissha; and raw material and R&D institutes such as the Holst Centre and Joanneum Research. Presentations included:

- Sabic's talk on PUR in-mold coating on polycarbonate film for exterior applications
- Rehau's lecture on quality criteria for FIM front panels
- Nissha on the challenges of film production for exterior applications
- HSL + Tactotek on smart lighting and in-mould electronics for brand identity
- The Holst Center on sustainability with in-mould electronics
- Joanneum Research on development of printed & in-mould electronics
- Kimoto described next-generation 3D formable substrates (their LevSurf formable films)
- Leonhard Kurz on integration of function and light with 'functional foil bonding'

The joint presentation by HSL and Tactotek showed an innovative concept of a complete integrated front panel realized by in-mould electronics. Advantages include easy integration and elimination of Interfaces; lightweight and sustainable material structure; homogeneous lighting, and scalability prospects.

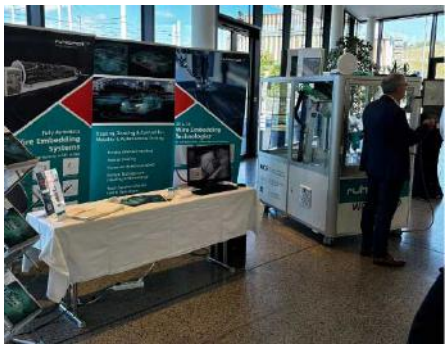


Detailed technologies were showcased during exhibition :

- Applications – optic, bionic, and microfluidic films by Johanneum Research Materials

- Illuminated front and rear ends by Leonard Kurz

- Wire printing equipment for heating elements by Ruhlamat



OLEDWorks Atala Lights for Audi Q8

LIGHTING NEWS

OLEDWorks' Atala OLED technology is included in the exterior lighting of the newly upgraded Audi Q8, in the form of digital OLEDs in the taillights.

Six panels span the rear of the car, each less than 1 mm thick—one each in the left and right lamps, and four panels in the full-width light band across the hatch gate. Every panel contains six high-contrast segments individually addressable via software control.

The optional rear lights with OLED panels also feature four light signatures, which include different dynamic welcome and leaving home lighting scenarios. A proximity-warning function illuminates all OLED segments when another vehicle comes within two metres from a stopped Q8.

This is the second Audi model to feature first-generation Atala OLED technology, after the A8 which has digital OLED technology as a standard feature.

New Cupra Leon and Formentor

LIGHTING NEWS

Cupra has styled new faces for the Formentor and Leon to better distinguish their model range from that of sibling brand SEAT, while introducing a new range-topping engine with 329 horsepower.

Focusing in on the cars' lighting:

Up front, the welcome ceremony is the introduction of the precise and iconic Cupra signature, based on three triangles. The headlamps on the Leon and Formentor have a DRL triangle composed of three massive light guides that synchronize harmoniously to build the signature.

In the taillights, Surface LED technology illuminates the position light function. In the Leon, the three triangles are concentrically joined by a triangular-shaped graphic treated with the aim of generating the greatest possible three-dimensionality. The taillights unite the illuminated logo and the triangles with a precise line that stabilizes the whole. In the Formentor, the triangles are formed by staggered horizontal lines which, when viewed from behind, complete the precise signature.

Driver Assistance News

Hesai Lidar in Marelli Headlamp

DRIVER ASSISTANCE NEWS

Marelli and Hesai have announced a collaboration to put Hesai's new ATX lidar technology into Marelli headlamps.

The goal is optimal object detection and enhanced overall vehicle safety, without impacting vehicle aesthetics or aerodynamics, all at affordable cost. The ATX lidar is a compact, highly customizable long-range sensor specifically designed for automotive applications. Compared to the previous generation product, the new ATX is almost 60 per cent smaller, which makes it much easier to integrate into the headlamp.

Marelli's headlamp design with Hesai lidar integration offers several key advantages.

- Enhanced safety: The precise positioning of the lidar within the headlamp ensures optimal coverage of the road and surrounding environment, enabling superior object detection and ranging for ADAS and AD functionalities. Marelli's new headlamp design is offered in two customized options to meet the diverse preferences of customers, accommodating both cost-effective and luxury car models.
- Seamless integration: The compact ATX lidar allows for effortless integration within the headlamp unit, maintaining the vehicle's sleek aesthetics and aerodynamic profile while also saving on material costs.
- Improved performance: The placement of the lidar within the headlamp provides a natural solution for keeping the sensor clean during operation, maximizing sensor performance in all weather conditions. Marelli's new headlamp design protects the lidar sensor and makes it easier to keep the lidar sensor clean, which helps ensure the lidar is in optimal working order to support intelligent driving functions.

General News

2024 Automotive News PACE awards

GENERAL NEWS

Automotive News announced their 2024 PACE Award winners at a gala last week in Detroit. This year, 13 awards went to suppliers and technology companies from multiple countries.

The PACE program also named four industry technical achievements as Partnership Award winners, recognizing collaborative work between a supplier and its automaker customer.

Here are the winners of the 2024 Automotive News PACE Awards and their innovations:

- Apex.AI, for the Apex.Grace software development kit
- Aspen Aerogels, for the PyroThin advanced thermal barriers
- BlackBerry QNX, for the IVY software platform
- Carbon Revolution, for mass-produced carbon-fiber automotive wheels
- Dana, for their multimode, electromechanical, infinitely variable transmission
- Dürr Systems, for their EcoInCure painted vehicle curing from the inside
- Magna, for their integrated driver- and occupant-monitoring system
- Nemak, for innovative sustainable material for lightweight high-pressure die casting
- Sensata Technologies, for their GigaFuse high-voltage passive/active fast disconnect
- Stanadyne, for their two-piston diesel common rail fuel pump
- Uveye, for their automatic vehicle inspection system
- Valeo, for their Scala3 third-generation lidar perception system
- Yazaki, for their flexible printed circuit bus bar module.

PACEpilot Recognition for 22 Innovations

GENERAL NEWS

The Automotive News PACEpilot program, which recognizes innovations that have not reached commercialization, separately named watchworthy innovations at the ceremony, from nine suppliers:

- Eaton's heavy-duty four-speed EV transmission for a broad range of applications in a small and lightweight package
- Exro Technologies' coil driver, an intelligent traction inverter that allows electric vehicles to go farther and faster on a single charge
- Forvia's eMirror Safe UX, a versatile technology that can be integrated into various electronic control units, cameras and displays and replace traditional side- and rearview mirrors
- Forvia Hella's Intelligent Power Distribution Module with an integrated electronic fuse using software algorithms to replace conventional fuses that melt
- Innolith Technology's I-State battery cell technology, a non-flammable, high-performance technology that uses a new inorganic electrolyte formula for improved performance characteristics
- Magna's modular and scalable active grille shutter assembly that can be affordably adapted to many vehicles with just five to seven common parts creating up to 90 grille shutter variations
- Magna Seating's fully melt-recyclable foam and trim that eliminates the need to send base foam pads and trim covers to a landfill and allows them to be reused in new polyester products
- Nemak's subframe prototype, which met specific requirements with a new aluminum alloy and an innovative design that was able to withstand crash tests and reduce the component weight by 45 per cent
- Bosch Automotive Steering's predictive vibration instruments and analysis tool kit, which tackles the challenges of virtual acoustic validation and engineering by minimizing uncertainty and making tests repeatable in any industrial environment
- Valens Semiconductor's A-PHY connectivity, which aids in software-defined vehicle design by providing a resilient, high-performance approach
- WarrCloud's cloud-based warranty claims automation technology that extracts the repair order from a dealership management system, checks all aspects of it against automaker policy and procedures via a library of AI-driven bots, and uploads it to the automaker’s system for payment

Zeekr 007 Wins Red Dot Award

GENERAL NEWS

The Red Dot is a famous design competition focused on design quality, and the Zeekr 007 has won a 2024 Red Dot Award for its design.

Designed by the Zeekr Design Team at Geely's Global Design Center in Gothenburg, Sweden, under the leadership of Stefan Sielaff, the 007 embodies Zeekr's philosophy which includes visual elegance with also pragmatic and intelligent solutions to meet user demands. For example, the Zeekr Stargate, an interactive social display (ISD) in the vehicle's front fascia.

This recognition recognizes Zeekr's commitment to excellence in automotive design. Congratulations to the entire Zeekr team on this well-deserved honour!