

Tue, 26 December
2023
Weekly Newsletter


DVN
Lighting & ADAS

NEWSLETTER #835

PixCell LED

Ultimate precision in perfect alignment

100+ individual cells with just 25 μm spacing, perfectly matrixed onto a single LED chip for intelligent headlamps



Editorial

End-Of-Year Good Wishes From Your DVN Team

All of us on your DVN team wish you a happy Christmas and a grand break time, to recharge your batteries with energy to start 2024.

The DVN team grew quite a lot over this past year: more people, more events, more activities. We will continue this trend in 2024, too, with new consultants and advisors to reinforce the team in Europe, North America, and Asia, and improve the quality of our events, DVNewsletter, and technical reports.

In the four months since I came onboard, we've run three events in San Francisco, Shanghai, and Wiesbaden; made a lot of new connections, and devised ideas and projects with an eye to propose new things in 2024. I really enjoy this new job, and I thank all the DVN team, most notably Hector and Jean-Claude, for having accepted me on the team.

Relax and enjoy your holidays; see you next year!

Take care,

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



In Depth Lighting Technology

2023 in the Mirror: Main Takeaways



By Paul-Henri Matha, DVN COO and Lighting General Editor

2023 was a long year, with a lot of salient events in the vehicle lighting and vision world. We got off to a fine start in January with a combo CES + Paris DVN event, then the Tokyo DVN Workshop, ALE in China, a US Workshop in San Francisco for the first time, ISAL in Germany, DVN Shanghai...numerous events, each a big success. So it was a long journey of a year, including the first two in-person GTB meetings after the Covid shutdowns eased off, in Tallin and Torino.

Now it's time to recharge our figurative batteries to get a running start at 2024's docket! A fine time to look back and summarize 2023. For me, the highlights include:

- Display explosion in China. Interactive Signaling Display (ISD) is clearly the trend, and most new BEVs in China have this sort of lighting feature.



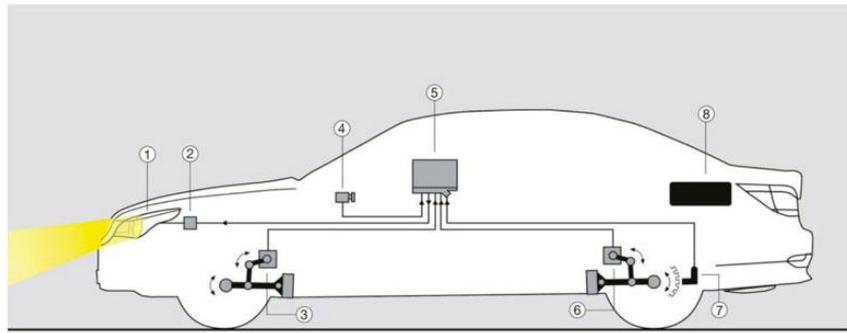
- Entry into force of 01-series amendments to UN Regulation 148 and 149 in January to permit lit logos and road projections, and some cars are already equipped (new VW Touareg shown here)



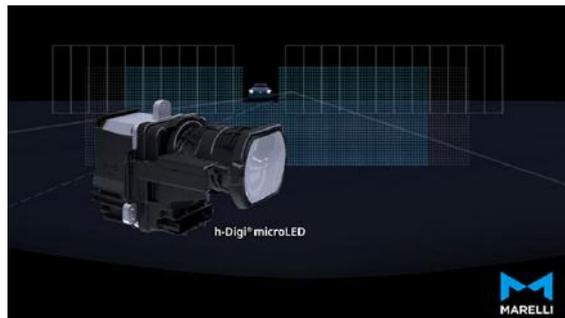
- Entry into force of 08-series amendments to UN Regulation 48 with mandatory rear position lamps by day below 7,000 lux ambient light, a requirement strongly pushed by northern European countries which will help cut down on vehicles invisible from the rear in darkness.



- Approval in GRE in October of 09-series amendments to R48, which will—after decades of delay—finally require mandatory automatic levelling for all passenger cars in the near future (new types in September 2027; all types in September 2030).



- Confirmation from lighting community that US-spec ADB is feasible, just a question of time.
- VW Touareg and Porsche Cayenne with microLED HD matrix technology from Hella/Nichia and Marelli/Osram.



I am convinced that 2024 will also be a prolific year for the lighting industry. My predictions:

- First US-spec vehicle equipped with ADB
- GRE approval for signaling road projection (SRP) in Europe
- New GB (Chinese reg) for RID and LSD with possibilities to have lit logos, road projection, signaling projections
- New C-NCAP rating with higher importance of ADB to get the 5-star score

Lighting News

PATAC Optical Lab Launches

LIGHTING NEWS



PATAC is the Pan-Asian Technical Automotive Centre, a joint venture between General Motors and SAIC. On 15 December, their new optical laboratory was officially launched in Tangzhen Park. PATAC Executive Deputy General Managers Lu Xiao and Wang Conghe; Communist Party Committee Deputy Secretary and labour union chair Niu Jieling, and directors of relevant departments and representatives of suppliers attended the event.

The PATAC Optical Laboratory is a comprehensive optical laboratory integrating vehicle-level, component-level, and lightsource-level optical testing, and is also the first vehicle optical laboratory with a standard measurement distance of 25 metres for domestic automakers. Measurement of vehicle lighting indicators is carried out through high-precision optical photometers; probes, and imaging luminance photography systems, and safety performance evaluation is carried out according to the authoritative evaluation indicators of the industry.



On opening day, the PATAC Optical Technology Exhibition was also held at the same time, which focused on the optical technology capability projects in terms of PATAC's 14th five-year plan, and provided a platform for peers to talk and listen about the latest technology.



PATAC Optical Technology Exhibition

With the opening of the lab as a new starting point, PATAC will pursue the light of user needs, and create greater value for users with innovative technologies and products.

BMW's New Light Tunnel Goes Live

LIGHTING NEWS



BMW team welcomes Wolfgang Huhn to Light Channel Next

Light Channel Next. That's the sign on a door indicating the way to the brand new BMW Light Tunnel, which hides in a nondescript industrial building that's also home to BMW's factory engineering department. Stefan Weber, Frederic Blanc, Tabea Schluerscheid and Max Dressel from BMW's Lighting Development Department welcomed DVN's Wolfgang Huhn to the new tunnel with the saying: "a craftsman is only as good as his tools". Of course, they were referring to the light tunnel, a new 'tool' planned; built, and equipped with great attention to detail. Joerg Kaelble, head of BMW's lighting and vision department, was on a business trip and regrettably couldn't join in for the visit.

Humans will politely wipe their feet before coming in—cars, too; the first detail that stands out is the drip area, where the cars can shed snow and rain water collected on the way to the clean light channel. It's quite an impressive facility: 132 m long with a working length of 121 m; 25 m wide, 9.6 m high. The 'road' surface is an asphalt-concrete layer with coating, finish, and surface colour typical of Munich roadways. There's 900 m² of curtain area.

Every lighting engineer knows how important the quality of the 10-metre surface is, for aiming the headlamps and assessing the light distribution. BMW have installed a device for automatic alignment of the car on rollers, which even takes into account different track widths of the front and rear axles. Above the 10m surface is a suspended ceiling in matte gray for stray light assessment. The precise and heavy projection wall can be lifted vertically over the entire width of the channel. All functions such as the room lighting and much more are controlled by an app on a mobile phone or tablet.

At the other end of the tunnel, three different surfaces are installed where customers often see light functions of their car: Underground garage (concrete), showroom (wooden parquet), and sidewalk (asphalt). The precise light carpet of the new 7 and the beautiful water flow effects on the floor out of the animated Swarovski crystals in the

7's headlight were demonstrated on the different surfaces. The light carpet is animated by four different superimposed projections, giving a very lively impression.

A new X2 and 5 Series were used to demonstrate the light channel functions and the ADB functionalities, all in the well-known BMW lighting quality. And all with the new signature—the grille light, which is a fine line of light around the contour of the BMW iconic kidney grille, homogeneous and with a colour precisely matched to the signal functions in the headlamp.

DVN found a most modern light channel designed with great knowledge and a big heart for lighting, for developing the future of light.



Huhn looks up the road at Light Channel Next



The new BMW 7 on the showroom parquet

CES Preview: Valeo Equipment on Zeekr's Newest

LIGHTING NEWS



The latest Zeekr model will be presented at Valeo's booth. Equipped with a 1.5-cm high Valeo ThinBiLite bifunction front lighting module and two digital panels comprising more than 1,700 LEDs, it offers users a unique, personalized and interactive lighting experience.

The same model will be presented at the DVN workshop in Munich on 27-28 February, in conjunction with a lecture from a Zeekr representative.



CES Preview: Marelli's Intelligent Social Display

LIGHTING NEWS



At CES next month, Marelli will showcase innovations under the theme 'Design-Led Innovation'. One of them: their Intelligent Social Display messaging feature, designed to support V2x communication. The ISD can indicate when the car is in autonomous mode, signal driver intent, and communicate to pedestrians with messages such as 'safe to cross' when approaching an intersection or crosswalk.

The ISD provides new opportunities for illumination and communication via light, on and around the vehicle. It is already in series production with two Chinese automakers with mid-resolution displays integrated into the vehicle front. For integration within the rear lamp or trunk surface, a second generation of high-resolution displays based on miniLED technology is in development; it also will be able to achieve homologated lighting functions.

There are many integration options available for the ISD. Chinese automakers are integrating the displays into front grilleboards and on the sides of vehicles, offering on-demand functionality and customized patterns for safety and socializing. And at the rear of the car, use cases include using symbols to convey information scenarios such as a traffic jam, accident ahead, or unsafe driving conditions. Too, a 'thank you' message could be shared after a vehicle has been allowed to pass or merge into traffic.

Synopsys Buy Imperas

LIGHTING NEWS



Imperas, a UK-based verification tool developer, have been bought by Synopsys in a deal closed on 12 December. Imperas founder and former CEO Simon Davidmann is pleased about it: "we are all happy here in Synopsys", he says. Initial reports focussed on the recent move into verification and modelling IP for RISC-V fir virtual prototyping but brushed over the strong position that Imperas has developed for ARM technology.

Synopsis' systems design group general manager Ravi Subramanian told eeNews Europe, "With the move towards software-defined products in multiple markets like automotive, consumer and HPC, both system and semiconductor companies are designing custom compute solutions optimized for specific software workloads".

Imperas combine high-performance simulation with powerful tooling to ensure code problems can be detected and repaired efficiently, while streamlining code execution. Their system includes technology for bug discovery that can trap an issue with code running across many processor cores in a variety of operational scenarios.

Driver Assistance News

Green Light for Turquoise Lights: States OK Mercedes AD Lights

DRIVER ASSISTANCE NEWS



Mercedes-Benz has become the world's first automobile manufacturer to receive permits for special exterior marker lights for automated driving in the U.S. states of California and Nevada. California has granted the automaker a 2-year exemption from rules that would ordinarily prohibit turquoise light, and the Nevada permit applies to Mercedes-Benz Model Year 2026 production vehicles and will remain valid until a statutory modification is achieved with the state legislature.

Both permits allow Mercedes-Benz to gain important insights into the interaction of automated vehicles and other road users. The notion that such marker lights might ease public acceptance of automated driving and contribute to road safety by advertising the automated driving system's status is one idea competing with its direct opposite, and these permits will allow real-world trials that could resolve that simmering debate. They also will allow traffic law enforcement officers and systems to identify the system's status and determine whether drivers are permitted to engage in secondary activities during the conditionally automated journey. Designed in accordance with SAE J3134, the turquoise-coloured marker lights are integrated into the front and rear lights as well as the two outside mirrors on the equipped Mercedes cars.



Mercedes-Benz CTO for Development and Purchasing Markus Schäfer says, "With the development of automated driving marker lights, Mercedes-Benz is once again setting new industry standards. We are the first automaker in the world to receive such approvals in the U.S., specifically in California and Nevada. The more automated driving vehicles populate the road, the more important communication and interaction between the vehicle and the environment become".

The automated driving marker lights will initially be integrated into testing vehicles in California equipped with Drive Pilot, the world's L^3 system with internationally valid type approval. Drive Pilot received certification in 2021 in Germany and in 2023 in Nevada and California (in the U.S., there is no type approval; each state requires separate certification—just as was the case with each and every item of vehicle lighting equipment before the 1968 advent of FMVSS № 108). In Germany, Drive Pilot has been available for order since 2022, and in the United States, the first equipped vehicles recently headed onto the freeways of California and Nevada.

Turquoise was the colour of choice because of its reliable and fast detection by other road users, and its differentiation from existing vehicle and traffic signal light colours such as traffic lights (green) and emergency vehicle lights (blue). Physiological and psychological factors weighed in favour of turquoise in almost all areas than other colours considered for this function. The development and approval of the new lighting concept involved collaborative efforts of an interdisciplinary team of engineers, compliance managers, data protection experts, and—significantly—ethics experts.



Mercedes-Benz is committed to standardizing the colour turquoise as a means to visualize the automated driving state, fostering global understanding and acceptance for this technology. So far, there is no general framework for using turquoise lights in production vehicles in the United States, China, or the most-of-the-world bloc of countries applying the UN Regulations. California and Nevada have taken the first important step toward a future globally-harmonized regulation for turquoise AD marker lights.

The first L3 models in China announced

DRIVER ASSISTANCE NEWS



Equipped with L3 autonomous driving system, AVATR 11, DEEPAL SL03, and ARCFOX αS have already started running on Beijing and Chongqing high-speed roads.

In addition, Mercedes-Benz, which has certified the L3 system abroad, BMW, which has been low-key before, and its own brand IM Motor have obtained the L3 autonomous driving test license.

At present, these 6 OEMs are mainly in 3 cities, namely:

Beijing: Mercedes-Benz, ARCFOX;

Shanghai: BMW, IM Motor;

Chongqing: AVATAR, DEEPAL Automobile;

And they have obtained L3 autonomous driving test licenses in high-speed areas.

It is reported that all cars applying for autonomous driving test licenses need to pass a closed field test and the corresponding level of ability assessment, including the ability to comply with traffic regulations, the ability to perform automatic driving, the ability to take over in an emergency, etc., and there are also procedures such as expert review.

For example, AVATR has passed the autonomous driving test of more than 5,000 kilometers of high-speed sections in Chongqing.

After passing the above assessment, examination and other processes, the vehicle is eligible for the autonomous driving test license.

At the same time, after hitting the road, the test vehicle also needs to install supervision facilities and upload data to ensure that the autonomous vehicle is tested at the specified time and on the specified road section, and is supervised at any time.

What models are on the road?

Among these OEMs, only AVATAR, DEEPAL and ARCFOX announced test models, namely AVATR 11, Navy SL03 and ARCFOX αS Advance Edition.



DEEPAL officially announced that the L3 level automatic driving function is only equipped with test vehicles, not equipped with general cars.

The other two models, the AVATR 11 and the ARCFOX αS Advance Edition, both have intelligent driving solutions from Huawei.



Both are equipped with Huawei's ADS 2.0 high-end intelligent driving system, using Huawei's MDC 810 computing platform, with a maximum computing power of 400TOPS.

The system also includes 34 sensors, including 3 lidars, 6 millimeter-wave radars, 13 high-definition cameras, and 12 ultrasonic radars.

For vehicles equipping with Huawei ADS 2.0, they already has intelligent driving capabilities that connect high-speed, urban areas, and parking, but L3 capabilities are still only equipped on test vehicles.

In addition, BMW announced that the long-wheelbase version of the BMW 5 Series will be launched in China, which has the ability to expand L3 autonomous driving in terms of technology.

IM Motor is applying for the Ministry of Industry and Information Technology's L3 announcement access pilot, trying to obtain the L3 autonomous vehicle pilot.

General News

Stellantis, Valeo Launch Reman Windshield-Cam

GENERAL NEWS



Stellantis and Valeo took a step toward realising their circular-economy strategic coöperation by launching the first windshield-mounted video camera remanufactured by Valeo at their Circular Electronics Lab in Nevers.

This premiere defines the path of Stellantis in being the first carmaker to offer remanufactured video cameras, blazing a trail toward a whole new 'SustainEra' reman product range dedicated to ADAS.

In 2022, Valeo established the Circular Electronics Lab in Nevers, focusing on a unique remanufacturing approach for rapid, high-quality product development, testing, and delivery.

Collaborating with Stellantis, Valeo successfully launched a remanufactured video camera within a year, saving up to 99 per cent of natural resources compared to new ones. This camera, the first of its kind from Valeo, offers the same 2-year warranty and performance as new parts. Stellantis are the first car-maker to integrate it in their aftersales offer.

SustainEra, the label identifying the Stellantis circular-economy spare parts range, guarantees up to 80 per cent of raw material savings and a cutdown by as much as half of CO₂ compared to equivalent new parts. Valeo are the first supplier to implement the new SustainEra security labels, which prominently display the new Circular Economy label.

Zeekr 007 pure electric sedan with 870 km range rolled off production line, will launch on December 27

GENERAL NEWS



On December 23, Geely's first batch of the Zeekr 007 mass-produced pure electric sedans officially rolled off the production line in China. Its presale started earlier at November's Guangzhou Auto Show, with the price starting at 229,900 yuan (31,800 USD). Two versions, standard (CLTC 688 km) and ultra-long-range (CLTC 870 km), will be launched on December 27, and delivery will begin on January 1, 2024.



The car comes with an advanced driving assistance system, equipped with lidar, 12 high-definition cameras, five millimeter-wave radars, 12 ultrasonic radars, and an NVIDIA Orin X chip.



The Zeekr 007 is available in two-wheel drive and four-wheel drive. The two-wheel drive is powered by a rear 310 kW Silicon Carbide (SiC) motor and has a 5.4 second 0 – 100 km/h acceleration time. The four-wheel drive is powered by 165 kW front and 310 kW rear SiC motors, and has a 2.84 second 0 – 100 km/h acceleration time.

Furthermore, the entire series comes standard with an 800V high-voltage architecture and features Zeekr's self-developed Golden Battery pack. Zeekr claims that its Golden Battery is the world's fastest mass-produced lithium iron phosphate battery with a maximum charging power of 500 kW and a maximum charging rate of 4.5C, and a 15-minute charging time can replenish the battery life by more than 500 km.

Nio ET9 start preorders for 112,800 USD, deliveries set to early 2025

GENERAL NEWS



Nio ET9 has nearly 700 hp, 120 kWh battery, three lidars, rear tables, a mini fridge, and Nio's self-developed chip. The company unveiled the executive flagship on Nio Day 2023, and it is already available for preorder for 800,000 yuan (112,800 USD). Deliveries will start in the first quarter of 2025.

ET9 is a large 4-seater with a raised profile and fastback tail. It is over 5.3 meters long, the precise dimensions are (L/W/H) 5324/2016/1620mm, respectively, and the wheelbase is 3250mm. The wheels are 23" and have Rolls-Royce-like center caps that don't move, so the Nio logo is always visible. In the rear, it has a *jet-inspired* active spoiler.



The car is equipped with Nio's in-house developed 5nm ADAS-dedicated chip called NX9031, which cooperates with Qualcomm 8295 and forms a supercomputing platform that Nio calls ADAM 2.0. There is also a second-generation super sensing system, Aquila 2.0, and the cabin is run by the SkyOS operating system.

ET9 has three lidars. One is traditionally on the top of the front windshield, as in all Nio's NT2 cars, and two on the car's sides.

The main competitors in China are the BMW i7 and Mercedes-Benz EQS. The first customer who preorders ET9 will receive 100 hours of free chauffeur service