

Tue, 21 February 2023
Weekly Newsletter


Lighting & ADAS

NEWSLETTER #791

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

Focus Shift: Paris To Tokyo

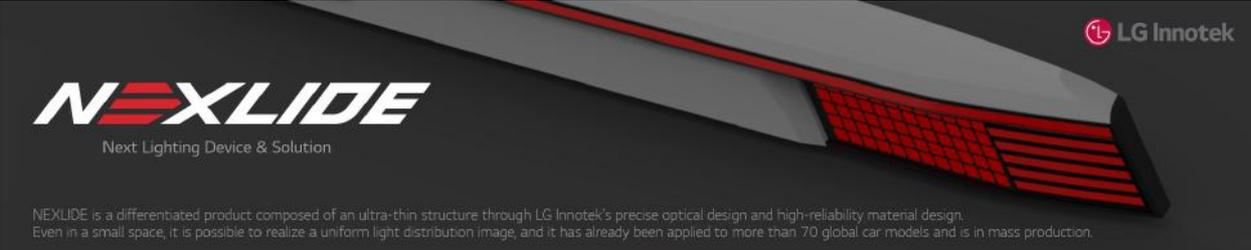
The DVN Paris workshop is now behind us. We achieved more than our target, with 350 attendees; 22 exhibitors; 10 lectures from car makers plus so many more from speakers representing other parts of the tremendous DVN vehicle lighting and driver- and machine-vision community. There was great emotion during all the event, and last week we published the report summarising the lectures and presenting information from the workshop. Indeed, it was a great experience, and DVN members can log in and find [on-demand video](#) from the workshop. In this week's DVNnewsletter, you'll find a booth-by-booth look at the expo portion of the event.

And now...onward! The DVN team are preparing a grand [Tokyo DVN Workshop](#)—hit the link for your early-registration discount! Five years out from our last event in Japan, we will come back with great pleasure. It will be a very pleasant time seeing and talking with all my Japanese friends from automakers and suppliers; we're all eagerly looking forward to seeing and hearing from Toyota; Nissan; Honda, perhaps Subaru, Koito; Ichikoh; Stanley... and other companies from Japan's rich vehicle lighting ecosystem, including tier-2 suppliers and research institutes.

Sincerely yours,


DVN CEO

In Depth Lighting Technology



Great Expo at Paris DVN Workshop



There were 22 expo booths at the DVN Workshop held shortly ago, where visitors could learn about the latest innovations in technology: technique, and function. Here's a look at the highlights of each booth:

A2MAC1



A2MAC1's Advanced Exterior Lighting is an all-in-one solution that unlocks the secrets of all headlighting systems on the market. After dismantling and analysing each component, they deliver reports on system performance; function; aesthetic design, and cost. All in partnership with LMI, specialists in lighting market studies and value-added data solutions and analysis.

AML Systems



AML showed and told booth visitors about condensation management strategies for providing more efficient avoidance of condensation in lamps at the design phase, and an intriguing levelling technique using MEMS to improve illumination through real-time adjustment of the levelling function to improve comfort and increase safety.

ams Osram



ams Osram showed off their Eviyos 2.0, a visualisation and illumination light source module with 25,600 pixels. They demonstrated RGB LEDs to support dynamic light effects realised by stripes of LEDs, including a unique in-house-designed driver and communications IC. And there was their Osrie E5515 RGB side-looker LED, moulded into a thin plastic trim part by using TactoTek's IMSE technique.

Ansys



Ansys' expo both showcased their Lumerical [FDTD](#) (finite-difference time-domain) system for nanostructure design, enabling simulation of light waves; diffractive optical elements for achromatic lenses; and CMOS image sensors to measure external quantum efficiency ([EQE](#)). There was also their Zemax OpticStudio for lens system design, a highly-regarded product for projection lenses; Speos for photometric and lit-appearance design, and AVxcelerate for real-time headlamp and sensor simulation. These products help engineers design and simulate innovative headlamps and sensors (particularly cameras; TOF cameras, and lidars).

Asyst



Asyst's heatsink adjuster module is used for forward or rear lighting, or any application requiring a heatsink for electronics.

It's an in-house design using thermally-conductive Covestro polycarbonate for a moulded heatsink bracket. The complete module can include LEDs; reflectors; lens; adjusters, and pivots. Asyst and Covestro are evaluating module designs with in-mould electronics as well as with assembled and fastened electronics. The goal is to provide a sustainable solution which reduces both mass and cost.

BlueBinaries



BlueBinaries specialise in areas including interior and exterior lighting systems. Their expertise enables them to take on the complete responsibility of lighting system development from concept to homologation.

Covestro



Covestro's displays are always fascinating. This time they showed a novel concept for a modular LED low-beam unit—a reflector with in-mould electronics to reduce weight, space, and cost. And there was a pioneering grilleboard, a slim, space-saving design, enabling designers to realise low-profile headlamps. It has a stylish metallic-black and body-colour appearance when unlit.

Dajac



Dajac brought their photometric light testing and aiming equipment for manufacturing, lab, and quality departments. They incorporate automation; fast cameras; user-friendly software, and data delivery.

They have a full range of equipment to test all kinds of car lights; the company works with many automakers and tier-1s.

Elmos



Elmos Semiconductors' ICs enable the lighting integration edge by offering adaptable, secure solutions.

- IC solutions enabling the transition from distributed lamp control architectures to centralized, zonal or BCM driven architectures.

- E522.88 intelligent LED driver has embedded SW.

- HS-CAN compliant robust interface IC's E522.94 and E522.95

Forvia Faurecia



Forvia Faurecia, having absorbed DesignLED and Irystec, showcased super-thin backlighting for applications like immersive displays and large-area interactive setups; decorative materials with animations controlled by app or touch-sensitive HMI; immersive display applications with perceived pillar-to-pillar extension of active display area, and image enhancement software including C-Dive and Smart Dimming.

Forvia Hella



In Forvia Hella's expo booth, they showed off their SS|HD lighting technology: more than 30,000 pixels can be controlled individually to realise new lighting functions. There was the SSL100, a miniature LED matrix system with 102 pixels which allows for all headlight functions to be software-generated to come from one lamp. There was their hot new FlatLight super-slim signal lighting technology, and of course their 'Front Phygital Shield' for large-area polyvalent grilleboards.

Inova Semiconductors



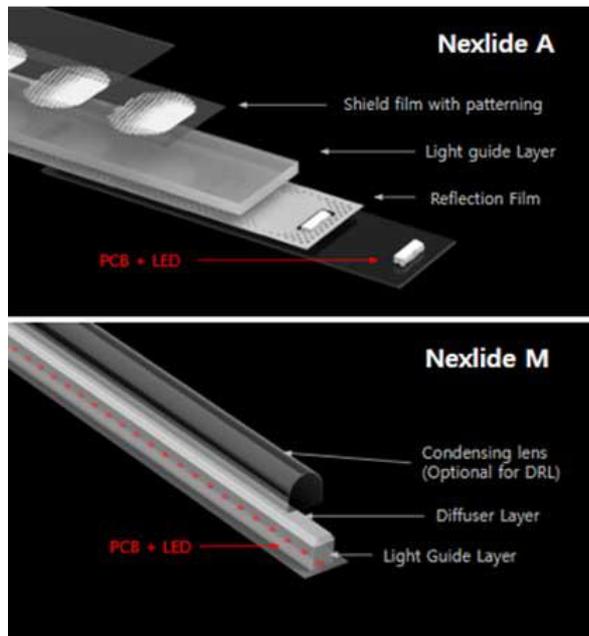
Inova's innovations on display involved a software-defined integrated light and sensor network called ILaS, for interior lighting applications. It allows low-cost migration of current interior lighting systems with only one microcontroller. Its software makes it simple to implement dynamic light scenarios by controlling each LED individually. To minimise cost and weight, the ILaS network can also leverage existing network infrastructure such as ethernet.

Instrument Systems



Instrument Systems' new AMS screen imaging system is for fast testing and measurement of all lighting scenarios of modern headlamps. It comprises a CIE type A goniophotometer; projection screen; 2D photometer, and DSP 200 high precision illuminance meter—which, itself, is designed for use with the proven AMS and SMS goniophotometers for rapid scans of vehicle lamps' light distributions, and also with critical PWM light sources of low frequency or extremely short duty cycle.

LG Innotek



LG Innotek's Nexlide range provides high-quality surface lighting in all applicable colours. Nexlide A is a slim surface-lighting solution offering high design flexibility and uniform light distribution. By moulding a side-emitting LED to the light guide layer, uniform light distribution images can be realised over a large area. The slim thickness allows for a variety of lamp designs and flat and curved surface lighting. Their Nexlide M structures the light guide and diffuser layer on the LED to enable perfect linear lighting.

LMT and TechnoTeam



LMT and TechnoTeam showcased their patented system for fast and precise measurement of automotive headlamps. Their Camera-based rapid screen goniophotometry combines the swiftness of digital luminance imaging systems—up to 100 times faster than standard goniophotometry—with the accuracy of traditional goniophotometers.

During the event, TechnoTeam's C. Schwanengel and LMT's T. Reiners presented interaction between measurement technology and legislation and standardisation.

Lumileds



Lumileds presented direct imaging systems for ADB with LED or μ LED matrix; their Luxeon NeoExact range of single and multi-row LED arrays for high-resolution (20-kilopixel) ADB; and tier expanded Luxeon 3D LED demonstrator, showcasing the new cyan colour and dynamic animation.

Marelli Automotive Lighting



Marelli's illuminated grilleboard responds to the revolution in front end design. They also showed off their impressive range of standard lighting control units and their first-generation light domain controller; taillights in 3D technology with 'moirage effect' using microoptics (Renault Austral equipment); their BMW i7 taillamp with impressive filigree patterns done by a unique printing method on the lens, and their first-generation hidden-until-lit technology in a JLR rear lamp mockup.

Microrelleus



Microrelleus showcased their light curtain demonstrators, both microstructured-tool-injected and directly-engraved. Their technology involves freeform microstructures; microoptics, or textures on standard production tools or prototypes to achieve environmental; design, and affordability benefits. The yield: attractive surface patterns with light scattering control in circular and elliptical formats, and the possibility to achieve almost invisible structures for different purposes. We especially like the "floating in thin air" effect of the rear lamp demonstrator in the pane of clear material, shown here.

Mobis



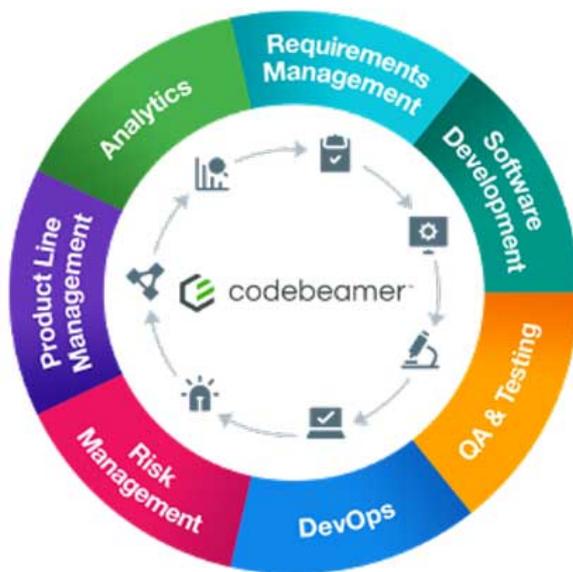
Mobis' future-mobility lighting products on display included their lenticular grilleboard technology, which displays different images depending on the viewing angle. Also, their Prism Slim Module, just 12 mm high, which combines a DRL and a low beam headlamp in a single module.

OLEDWorks



OLEDWorks showed off a demonstrator developed with Valeo; Corning, and STMicroelectronics. It contains the highest density of individually-addressable segments of any flexible OLED panel. Flexible OLEDs offer the same uniform illumination; high contrast, and ultrathin profile of rigid OLEDs on a flexible glass substrate. It's also the second demonstrator to demonstrate ECE/SAE-qualified deep red and amber light from OLED sources.

PTC & Nanga Systems



PTC and their partner, Nanga Systems, provide software for the automotive industry to optimise revenue; costs, and efficiency. Their latest offering is Codebeamer, an application lifecycle management platform for modern product and software development. It helps organisations simplify their complex product and software engineering at scale, and extends application lifecycle management with product line configuration capabilities.

Valeo

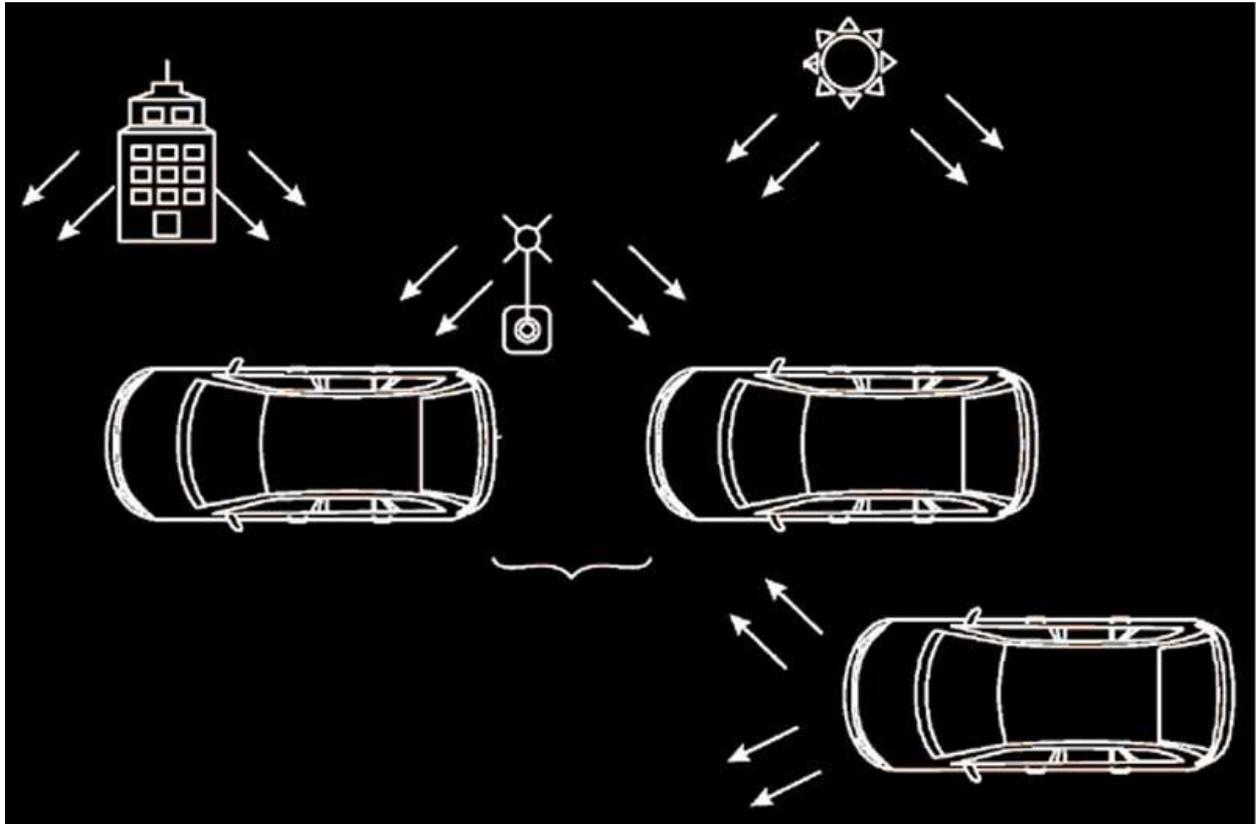


Valeo were showing off a future front fascia including their LineLens lamps, just 5 mm high. This breakthrough module is central to a completely reworked fascia presenting also a seamless integrated and illuminated panel with appealing communication scenario. An appliqué under the hood also creates a thinner lens appearance and continuous linear lighting and signalling functions. Valeo's expo booth pushed the Lighting Everywhere theme—an experience they envision as more appealing; smarter; cleaner, and greener.

Lighting News

New Ford Patent: Reactive Self-Dimming Lights

LIGHTING NEWS



Ford have been granted a U.S. patent for a system to keep track of ambient light and automatically adjust the output of vehicle lamps to dynamically appropriate levels. It's [patent № 11565624B2](#), and in the abstract, Ford say it's a method of determining ambient light intensity around a vehicle, determining the luminance of an exterior light on the vehicle, determining the difference between the two, and selectively adjusting the luminance of the car's lights based on that difference. Elsewhere in the patent, Ford explain in more detail: "External lights can be dimmed when the vehicle exterior sensors sense an optically bright environment, and return to normal brightness automatically once the environmental lighting is not adequate. Broadly, the dimming of an external light of a vehicle [...] can reduce power consumption compared with vehicles that operate their external lights [always] at full power. Thus, these systems and methods can improve vehicle fuel consumption [...] without hardware disruption" and by using the vehicle's existing exterior sensors.

The system could be used to control exterior lamps' luminance in response to ambient light intensity created by natural light (sun) or artificial light (city or street lights; other vehicles' headlamps, etc)...and in response to other factors, such as vehicle separation distance: If the vehicle is in stop-and-go traffic or waiting behind another car at a stop light, the headlamps of the equipped vehicle could be dimmed.

Osram Sylvania to Expand US Operations

LIGHTING NEWS



Osram Sylvania, the only major company making light bulbs in the United States for cars, have announced a major new investment in their plant at Hillsboro, New Hampshire. Sylvania have been manufacturing at Hillsboro for over seven decades, and now are putting several million dollars into the plant to expand operations.

CEO Mark Savoy says "We've got some space within the plant that we're able to streamline our operations, do this much more reliably and much more efficiently". The plant produces hundreds of thousands of car bulbs every day; the investment will result in new on-site packaging operations, rather than transporting finished bulbs to be packaged elsewhere as is presently done. "We will continue to manufacture the bulbs that we have in the past, but we will now be integrating into our facility all of the packaging operations that will then send the product out to the field for distribution to our retail partners," Savoy said.

Supply-chain issues have crimped the availability of automotive light bulbs, and this new investment will help make sure car bulbs are readily available; Osram Sylvania is by far the most widely stocked brand at parts stores and other retail outlets in North America.

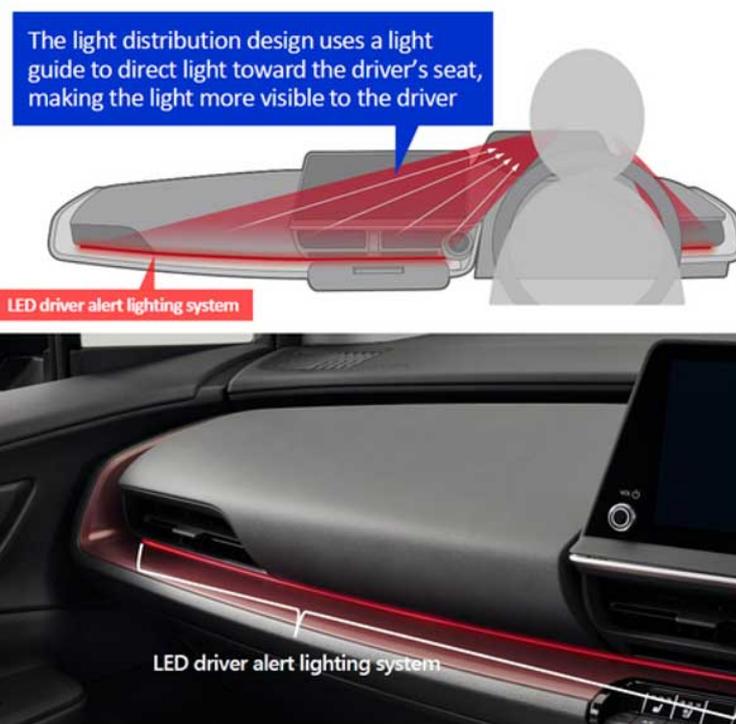
Other targets of the investment are to enhance production and distribution; all in all, the expansion will bring 75 to 100 new jobs. Savoy explained: "Those jobs are really across all functions. If people are interested in sales; marketing; engineering, and manufacturing, there's all kinds of jobs". And Hillsboro plant manager Jim Faulhaber says "In my nearly twenty years with Sylvania, two things have been constant: the company's dedication to excellence and its strong commitment to our people. There is a reason our plant has thrived here for over a half century and generations have viewed us as an employer of choice. We not only offer great benefits, we also offer a career path forward for every team member".

Toyota Gosei's LED Driver Alert Light System

LIGHTING NEWS



Toyota Gosei have developed a system which adds a driver-alert function to decorative lighting. This system is used on the new Toyota Prius. The system visually alerts drivers using strong light at times such as when they remain stopped at an intersection without noticing that the vehicle in front of them has moved forward, or before the vehicle's automatic deceleration system begins operating when a pedestrian or some obstacle is detected. The brightness of the strong light used to alert the driver is about 30 times higher than conventional decorative lighting. The light distribution design uses a light guide to direct the light toward the driver's seat, so that it is easily noticeable by the driver even during the day.



Hella Did Well in FY22; Fortunes Look Bright for FY23

LIGHTING NEWS



Forvia Hella announced their preliminary results for the short fiscal year 2022 (1 June to 31 December 2022) and the outlook for the fiscal year 2023. They generated sales of €4.4bn in FY22, with an adjusted EBIT margin of 5 per cent (compared to 4.4 per cent in the previous FY). CEO Michel Favre says, "In the short fiscal year 2022, we delivered a solid business performance and again won numerous high-technology, large-volume customer projects with an order intake of around €7bn".

In the Chinese market, the lighting business has developed successfully, also due to series launches, which have now continued to ramp up. In the Electronics business group, sales amounted to €1.9bn. Main contributors were energy management; body electronics; sensors, and actuators. EBIT was €124m, and the EBIT margin has increased to 6.5 per cent (versus 5.5 per cent the previous FY).

The Lifecycle Solutions business group racked up €0.6bn in sales, and the spare-parts business was successful in key regions. The commercial-vehicle business recorded high demand from manufacturers of agricultural machinery; trucks, and trailers, with EBIT of €58m on margin of 10.1 per cent (12.4 per cent in the previous FY).

Hella are predicting record sales of €8bn to €8.5bn in FY23 (January to December 2023), with an operating income margin of 5.5 to 7 per cent. Favre says "We expect the market environment to continue to be volatile. However, thanks to our solid order book, we remain optimistic about the future. Therefore, we expect to achieve record sales in 2023 and to exceed €8bn in sales for the first time".

DVN Interview: DesignLED

Extract of interview led by Philippe Aumont, DVN Interior director

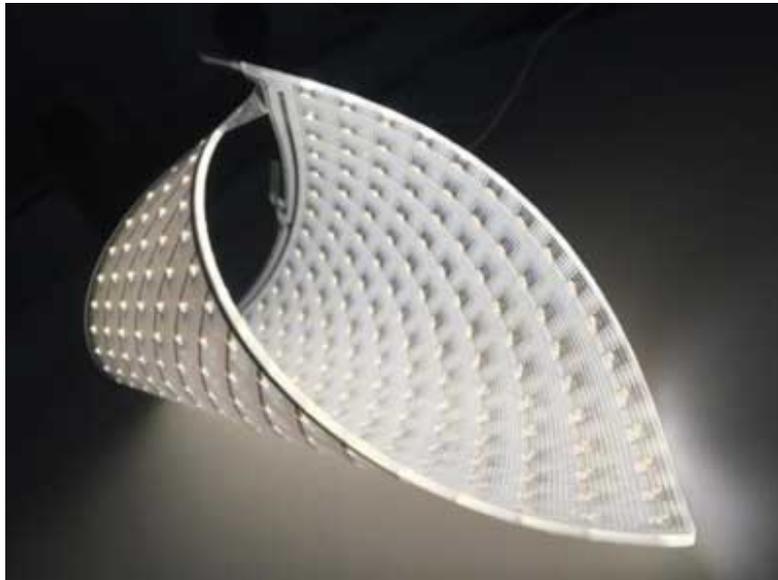
LIGHTING NEWS



L-R: P. AUMONT; S. BAIN, DR. J. GOURLAY

Coming from an academic and OLED optics background, Dr. James Gourlay had an idea 20 years ago: is it possible to reach and beat the homogeneity and illumination performance of OLEDs, using low-cost commodity inorganic LEDs?

That's the journey DesignLED have been on since then. The technology itself is simply brilliant: a super-slim flexible light guiding system with printed optics in different layers, manipulating light to optimise system thickness; LED count; cost, and—critically as we move to EVs—power.



Stuart Bain joined James as CEO some years later to help him realise maximum market potential. Business is usually about interpersonal relations and interactions. Bain and Gourlay say the chemistry in their team is extremely strong: "We complement each other very well at a professional and personal level".

"Technology itself can be quite boring and difficult to explain, so what we do is not just invent great technology but visualise it in a way that is meaningful to the customer and show them the problems it can solve; the use cases, and—critically—the value it can deliver. Part of our core strength is how we present technology graphically or virtually, often as a physical demonstrator to give the customer something to play with. We need to put something on the table, very tactile, very visual. It's not boring to talk about technology when you can see and touch it.



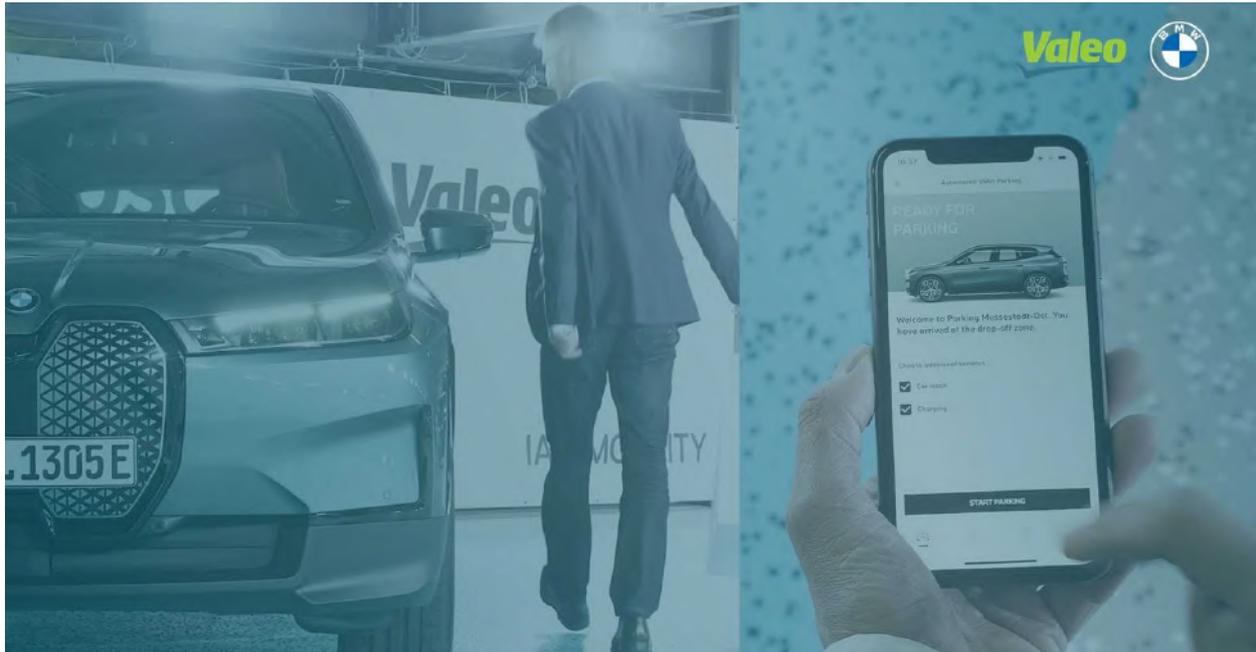
'QUADRO' LARGE-AREA MATRIX ADDRESSABLE RGB BACKLIGHTING

"The strength of our organisation is the depth of knowledge, where the value of the team is greater than the sum of the individuals. Technically, it's all about optics, and how you manipulate light for different scenarios and different applications; here we are world class, and that's why we are selected by customers for the most challenging projects. Add to that the critical mass of Forvia, and it is frightening what we can achieve!

Driver Assistance News

BMW and Valeo: L4 Full Auto-Park

DRIVER ASSISTANCE NEWS



BMW Group and Valeo, having already announced their collaboration on ADAS controllers; sensors, and software for parking and manoeuvring of the automaker's 'Neue Klasse' platform, the two companies now announce cooperative development of L⁴ fully automated parking technologies.

In January, both companies signed a strategic cooperation agreement for joint development of a range of high-end 'parking user experience' for customers on private grounds and in parkades. Including the likes of automated manoeuvre assistance and L⁴ automated valet parking, all functions will be based on technology and sensors in the car. Infrastructure-based services will also be jointly developed to experience fully automated parking and charging in enabled public parking facilities and sites.

The software functions are based on the current automated parking software stack first launched with the BMW iX in 2021. It will be further extended by a powerful computing platform hosting the jointly developed algorithms.

Automated valet parking offers a fully automated and driverless parking experience. At a drop-off zone the driver leaves the car and the vehicle takes over tasks such as autonomously finding a parking spot; making the manoeuvres for parking, and driving back to a pickup zone to return the vehicle to the driver. To optimise use of the parking time, additional services like fully automatic charging or washing can be performed, as well.

Commercial Laser Sales Boost Lumentum

DRIVER ASSISTANCE NEWS



California-based Lumentum have posted quarterly revenues of USD \$506m, partly on account of a sharp increase in sales of fibre and ultrafast lasers for industrial applications. Lumentum's business is primarily focused on optical- communication and 3D sensing applications, but their commercial laser division's revenues were up 16 per cent year-on-year to \$57m, a long-term high. CEO Alan Lowe told investors fibre lasers make up the largest chunk of that total, but sales of ultrafast lasers have more than doubled over the past 12 months.

Lumentum supply VCSEL arrays to Chinese lidar firm Hesai, who entered a supply agreement with Chinese automaker Changan.

General News

Ford Competitors Have Engineering Efficiency Edge: Farley

GENERAL NEWS



Ford CEO Jim Farley recently said on a radio talk show, "It takes [Ford] 25 per cent more engineers to do the same work statements as our competitors (...) I can't afford to be 25 per cent less efficient".

Farley said last week that avoidable expenses and supply-chain issues cost Ford a combined total of about \$2bn last year. He pledged to cut \$2.5bn in costs this year, and says that might involve job cuts.

Ford eliminated about 3,000 positions last August, most of them in the U.S. German union IG Metall warned last month they're expecting about 3,200 reductions across Europe, while Bloomberg reported last July that Ford were preparing to cut as many as 8,000 jobs.

Ford have announced they will reduce bonuses for hundreds of top executives—including Farley, who's been CEO since October 2020. The automaker's shares have almost doubled during his tenure.

US Light Vehicle Sales Grow Slowly

GENERAL NEWS



Year	2019	2020	2021	2022	2023
Million units	17	14.5	14.9	13.7	14.9

GLOBAL DATA

The market is still running below pre-pandemic levels, and January's vehicle market growth in the US is on backdrop of a low base last year. The forecast outlook for the year is for 9-per-cent growth, taking the US light vehicle market to 14.9 million units. General Motors appear to now be operating at close to normal, having been one of the first manufacturers to suffer from supply chain disruption. GM were the leading automaker in the US market in January, leading Toyota Group by over 50,000 units, compared to a lead of 41,000 units in December. Toyota continue to contend with inventory shortages. The Ford F-150 pickup truck retained its title as the best-selling light vehicle in January, ahead of the competing Chevrolet Silverado by 8,000 units.