

Tue, 5 December 2023
Weekly Newsletter

DVN
Lighting & ADAS

NEWSLETTER #832

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

SAMSUNG



Editorial

Take Me To Your Lidar: DVN Conference N° 6, Big Plans For '24



This past week, your DVN team put on our last event of 2023: the Lidar Conference, with around 160 attendees in Wiesbaden.

Lidar is very much a central topic for DVN. That's why we have a lidar-specific business unit, led by Eric Amiot, with support from Martin Booth in the USA, and Alain Serval in France—really a terrific team. It was the first time I attended as part of DVN, and I was quite impressed by the quality of the presentations and the atmosphere in the room.

Not long ago, lidar integration in lamps was nothing but an interesting possibility. As it has happened, most makers are choosing to put long-range lidar on the roof, especially for highway pilot functions. But lidar integration in lamps is still on stage for short-range detection in L⁴ and L⁵ vehicles, particularly with FMCW lidar technology. That's the focus of this week's in-depth article.

And now, the DVN lighting team are focusing on 2024!

We are preparing actively our [first event](#) in **Munich**, on 27-28 February, with the theme *Design and Lighting Technology and Electrical Architecture to Support New Mobility*. We're adjusting the organisation of this event: to make it more interactive, there will be ten sessions: Design · Electrical Architecture · MLA · Trucks · Motorbikes · ADB · Exterior Displays · V2X · Complete Front and Rear · Sustainability. Each session will have presentations from automakers and tier-1 and -2 suppliers.

Also new: every exhibitor can make a 1-minute pitch at the beginning of the event to talk about their company and the attractions at their booth, and we will make an official visit to each booth during the first day.

There will be three panel discussions with interactive audience participation supported by the Slido app. The survey questions will be sent to all DVN members a month beforehand to have additional feedback, which we'll use to shape the panel discussion topics for maximum relevance.

Then the next event will be in **Detroit** on 11-12 June. I am investigating the possibility to organise a night drive with US-spec ADB demo cars from automakers and suppliers —stay tuned!

In September we will go back to India for an event in **Pune** (our last event in India was in Delhi in 2016). We have seen big interest from Indian automakers and suppliers to attend such an event. LED penetration in India is a central topic, with others besides, so watch for the date and docket as they develop.

To close the year, we will be back in **Shanghai**, in November.

As always, we shall strive—we're already working—to make each and every event better than the previous one. We treasure your support; these events are *your* events, and without you we cannot do anything worthy. So by all means, if you see something (as the saying goes), say something! Got a thought for how any of these events might be made better? Please [give us a shout](#) about it.

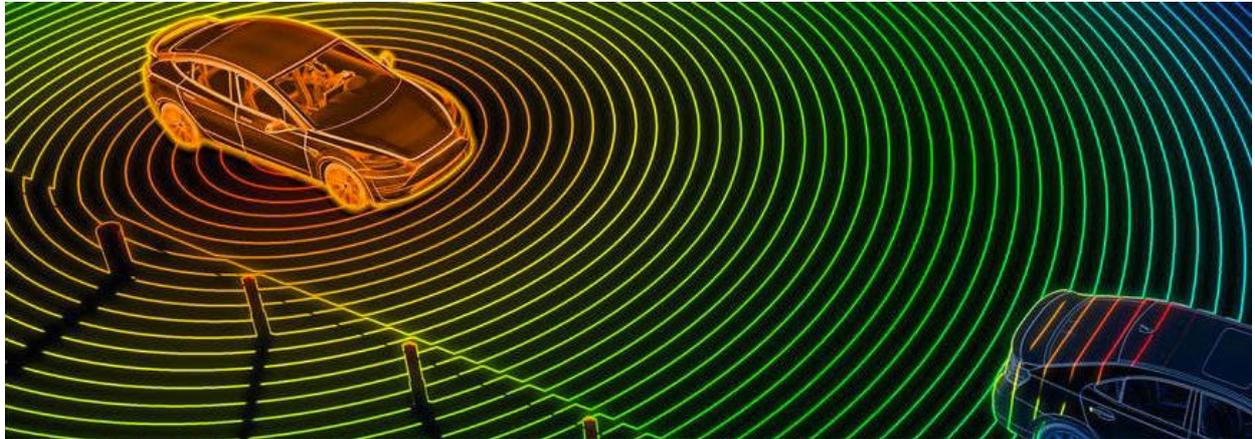
Paul-Henri Matha

DVN Chief Operating Officer and Lighting General Editor



In Depth Lighting Technology

Lidar integration in lamp is again on stage



DVN Lidar event in Wiesbaden occurred on the 29th and 30th of November. Around 160 attendees from OEM, Lidar supplier, integration suppliers (lamp, windshield, roof, bumper), tier 2 (light source, EOL machinery, testing, proving ground), gathering the complete community and supply chain.

Most of the products on the market are located on the roof for long range detection (especially). This is currently the best location with current technology.

LIDAR ROOF INTEGRATION
High viewpoint for perfect traffic overview

Roof integration: combining advantages of glass trim integration with a high vantage point

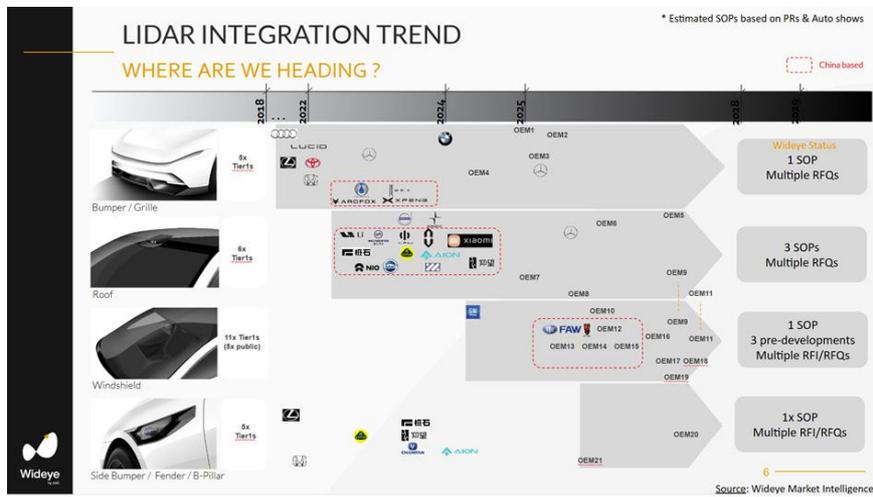
- Glass trim providing a design freedom vs. vehicle styling
- Auto grade solution
- High optical quality
- Integrated heating
- Anti-reflective coating
- Water Repellant Coating
- Black glass solution
- Safety glass, meeting R43 regulation



Example roof module Volvo EX90
© Volvo Cars

Wideye

8



However, windshield integration is coming and different lidar suppliers are mentioning that validations have been done and integration is now possible. 1st SOP for AGC is in 2024 for example.

FRONT INTEGRATION WINDSHIELD USECASE

Performance

- Long detection range
- High perspective view
- IR transparent

Reliability

- Optimal protection by the windshield
- Low exposure to dirt and damages
- Existing cleaning and heating solutions
- Rigid mounting system

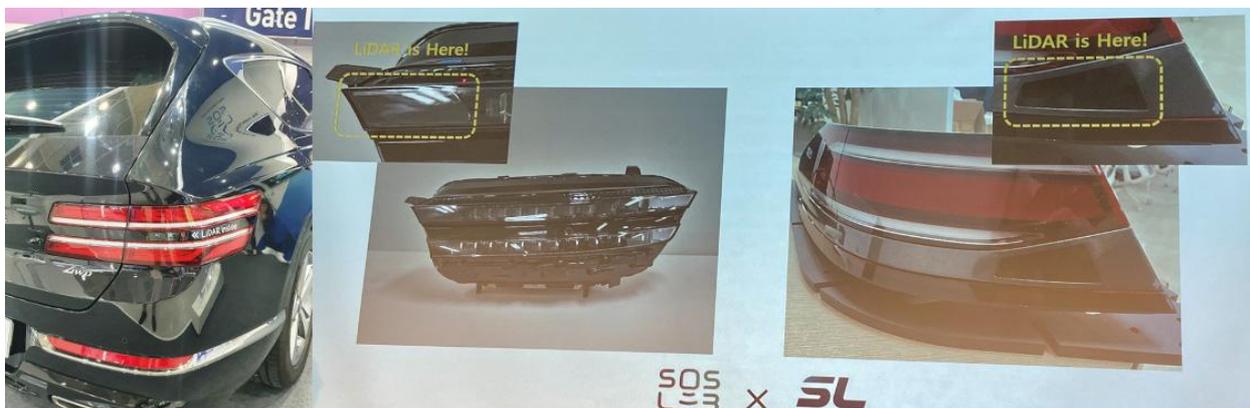
Design

- Seamless integration
- Efficient aerodynamics
- Shared resources with camera

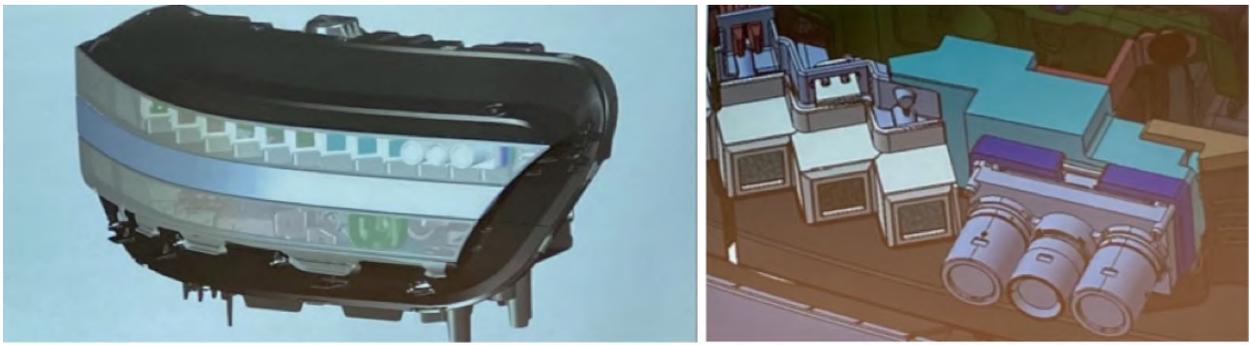
Glass laminate
 AR coating
 IR Filter
 Blackband Custom
 Lidar Sensor
 Camera Sensor
 Bracket & Glare Shield
 Cover Custom

But for short range detection, for L4 and L5 AD vehicles, there is the need to detect pedestrian and objects near the vehicle at low speed. For redundancy, Camera and Radar technologies seem to be not enough and there is still the need for a 3rd sensor like Lidar. A lot of companies have shared during the event their view about their short range lidar sensor integration in headlamp :

- SOSLab and Opsys are working with SL Corp for lidar integration in headlamp and rearlamp
- Cepton is working with Koito



SOS LAB & SL



OPSYS & SL



CEPTON & KOITO

The market evolution is very fast. Estimation for 2028 is a market around \$4,5 Billion compared to a market around \$ 300 Million in 2023. New technologies are coming and will be ready in 2028 like FMCW (small size, smaller integration).



Lighting community should focus more on short range lidar integration to be ready soon. Lidar cannot be hidden like radar in bumper. And to have exterior lidar like robotaxi seems not to be the solution for designers



Lighting News

Flash! Covestro E-Mobility Live Panel Discussion is TODAY!

LIGHTING NEWS



#CovestroLive

Meet the Innovators live:
E-mobility

PAUL SNYDER
Chair of
Transportation
Design, College for
Creative Studies

DANIEL STERN
Chief Editor,
Driving
Vision News

**PAUL-HENRI
MATHA**
COO, Driving
Vision News

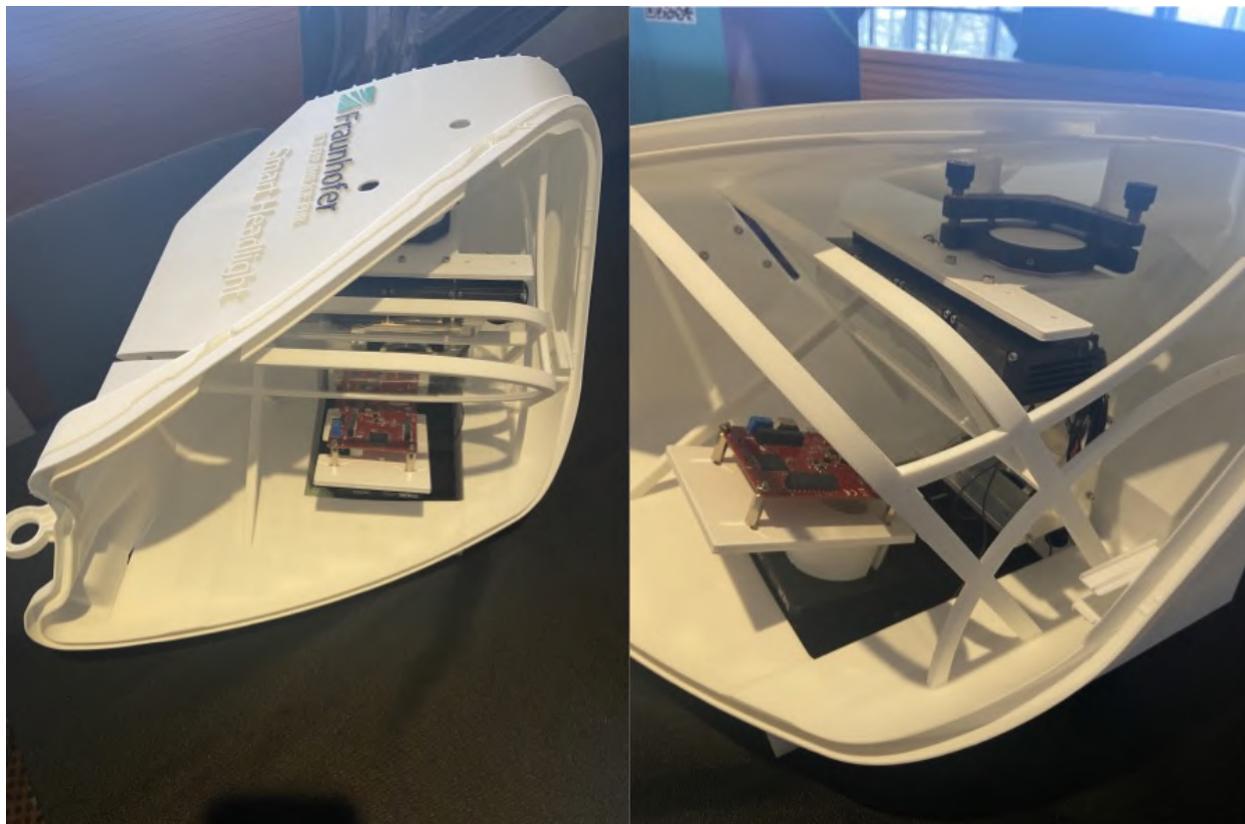
KAREN GUZMAN
Automotive
Marketing
Manager,
Covestro

DEC 5 2023 | 5 PM CET

Covestro are hosting a live, interactive panel discussion on E-mobility today at 5pm Central European Time (11am Eastern, 8am Pacific). Panellists include DVN COO and Lighting General Editor Paul-Henri Matha, DVN Chief Editor Daniel Stern, College for Creative Studies Transportation Design Chair Paul Snider, and Covestro's Automotive Marketing Manager Karen Guzman. Anyone can join in and participate on [LinkedIn Live](#) or on [YouTube Live](#). We'll see you there...shortly!

Coaxial RADAR, LiDAR and Light Integration in Smart Headlights

LIGHTING NEWS



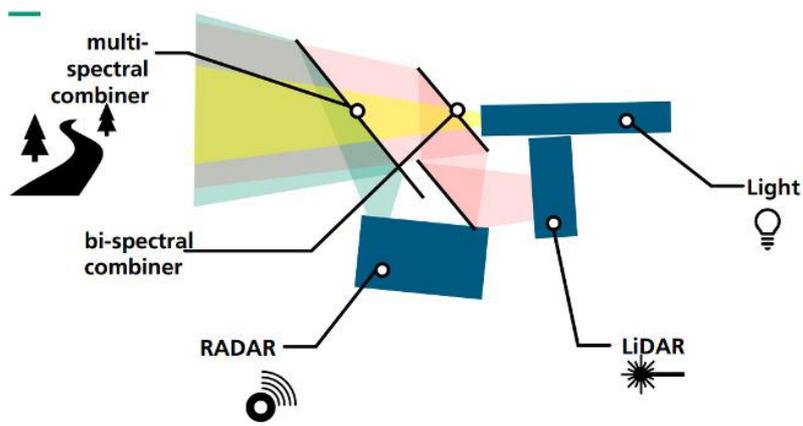
A smart solution for headlight presented by Fraunhofer

Last week at the DVN LiDAR Conference in Wiesbaden, Germany, Prof. Dr. Arnold Gillner, Fraunhofer, Department Manager Ablation and Joining, presented a very interesting solution to combine both a RADAR, a LiDAR and a main lighting module in the same headlamp with a coaxial solution.

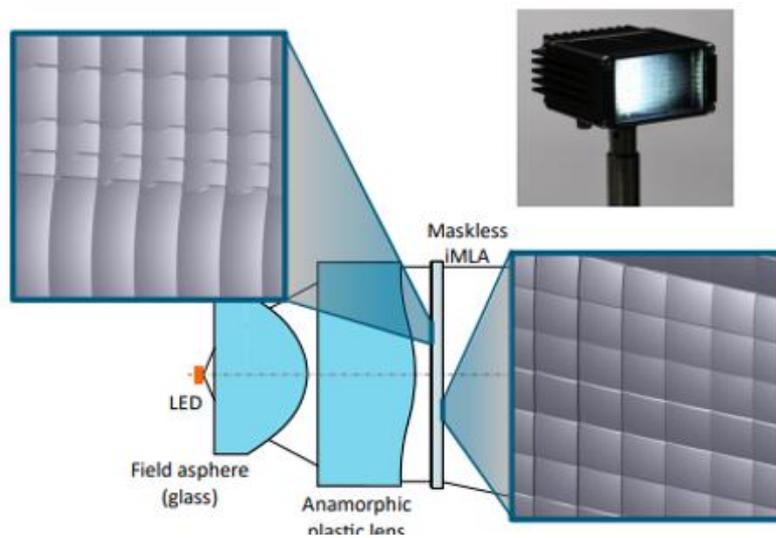
The ADAS sensors RADAR and LiDAR as well as naturally a good front lighting system are necessary to ensure the best level of safety. Currently, there are various locations for these different components, and the attempts to install all them in the same headlamp housing as discussed since some years were thwarted by space problems.

The main idea of Prof. Arnold Gillner and his team was first to imagine the most compact solution for each of the functions, and then to make the rays emitted by each of the modules use a partial common path, the targets being to have freedom for design, clear line of sight in all conditions, and an good location for the sensors at the front corners.

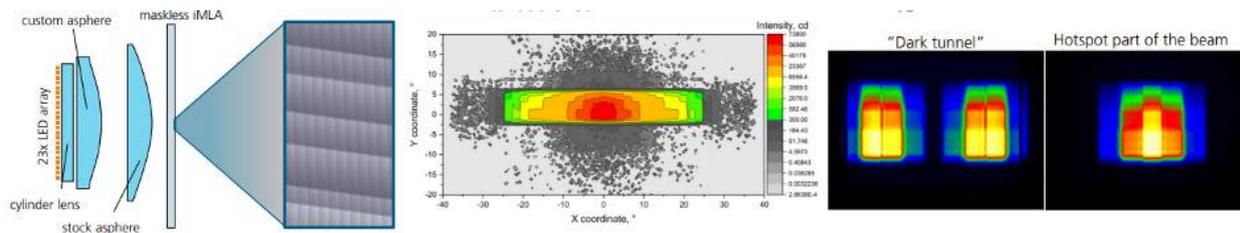
This can be achieved by the combination of visible light and LiDAR infrared light with a bi-spectral combiner, and the combination of rays from lighting module, LiDAR and RADAR with a multi-spectral combiner.



To achieve a compact lighting module, MLA are used. For the low beam, completely maskless MLAs on both sides and a simple collimator architecture are allowing size reduction to leave room for sensors. Each module is achieving 10,5kcd, so the four are delivering 42kcd with a level of 75% global transmission rate.

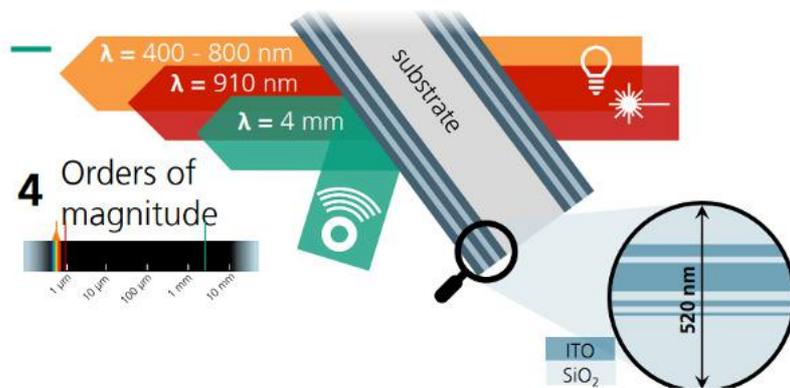


Similarly, high beam is using maskless MLAs, irregular in vertical, regular in horizontal and 21 switchable dark tunnels of 2° are achieved for ADB purposes.



The substrate used for the bi-spectral combiner is allowing a transmission of 90% of the visible light and a reflection of 98% for the LiDAR rays.

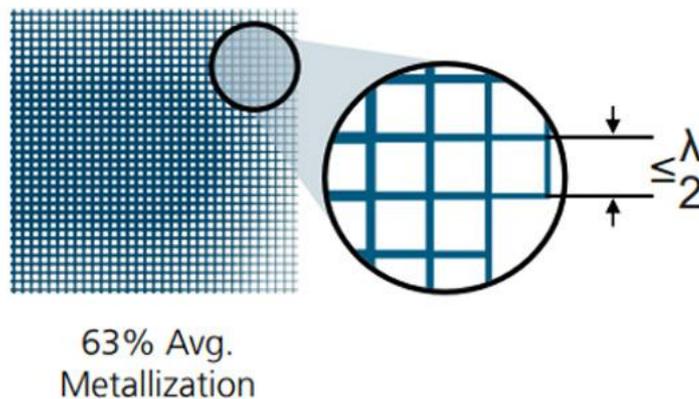
The multi-spectral combiner must allow a good transmission of the visible light at $\lambda = 400-800\text{nm}$ and the laser light at $\lambda=910\text{nm}$, and a good reflection of the RADAR rays at $\lambda=4\text{mm}$.



For this combiner, the targets are to keep the radiation pattern of the RADAR, a high bandwidth, with only single sided metallization to increase the optical transmission here with a loss less than 5%.

The Fraunhofer approach is to reduce the metallization with an adaptive pattern.

With this approach, there is a 3 dB difference in signal strength between fully coated and structured combiner, so around 15% reduction in max. achievable range, and 7 dB difference in signal strength between best combiner and metal sheet, so around 33% reduction in max. achievable range.



There is also an innovative approach for the LiDAR, the signal being individually encoded with random numbers in order to avoid interference with other LiDAR emitters, with a photon-based true random number generator simultaneous to distance measurement and a data rate for random number generation. With 144fps, it is 10 times faster than today, using 0,5% memory of the compared state of the art, and achieved in a compact 2x7x6cm³.

New Renault R5

LIGHTING NEWS



Renault will be staging the world premiere of Renault 5 E-Tech electric on 26 February at the Geneva International Motor Show. Renault will sell it with two battery options, including one with a capacity of 52 kWh, for a range of up to 400 km WLTP.

Exclusive pictures were revealed last week, with a specific focus on exterior lighting :

Headlights



The headlights of R5 are a key design feature, making the front end instantly recognizable. It is not only their shape that sets them apart, but also the mark in the center of the lens, resembling the pupil of the human eye. This nod to the 1972 advert featuring "The Adventures of Supercar" gives the modern-day R5 a human-like expression.

A charge indicator light on the bonnet



At the front end, the air intake present on the bonnet of the historic model has disappeared. Clearly showing that Renault 5 E-Tech electric belongs to the world of electric vehicles, it has been replaced by a charge indicator light forming the iconic number "5" when the vehicle is fully charged. A high-tech feature that is also functional and fun, this indicator is a great example of an accessible interface with a human touch, showing the battery charge at a glance.

Rear lights



The vertical rear lights include a function extending the side panel. This feature contributes to the aerodynamic performance of R5 by preventing air turbulence.

Congratulations to the lighting team and especially Jerome Verdon, product seems to be amazing.

ZKW expands site in Mexico by a further €100 million

LIGHTING NEWS



ZKW is accelerating its international growth and investing disproportionately in the Silao/Mexico location as a strategic orientation for the important American vehicle market. With a ceremonial opening, the ZKW Group officially commissioned the third expansion phase of the Mexican plant in Silao with an additional 15,700m².

At the same time, the groundbreaking ceremony was held for the next expansion phase, which will create a total of around 7,000m² of additional production space and 1,100 new jobs by 2025.

“With the expansion, we are increasing production capacities and creating around 2,000 new jobs to manufacture innovative lighting systems for customers in the strategically important NAFTA economic region,” explains Dr. Wilhelm Steger, CEO of ZKW Group GmbH. ZKW is investing more than €100 million in Silao with the third plant expansion.

ZKW has been producing headlights for premium car manufacturers such as BMW, Ford Lincoln, General Motors, Mercedes Benz, Nissan Infiniti, Volkswagen and Volvo in Silao since 2016.

The company currently employs 1,658 people in Mexico, who produce lighting systems for numerous car manufacturers in the USA and Mexico. From 2025, headlights and center lamps for VW and GM are to be produced in Silao.

North America is a strategically important market for ZKW, which could be the second largest in the world by 2028, accounting for around 30% of sales. “The long-term goal is to further strengthen ZKW’s growth strategy, especially for the USMCA market. By 2026, ZKW México plans to produce around 4.5 million headlights per year with up to 4,000 employees,” explains Dominique Boulegue, General Plant Manager ZKW Mexico.

Driver Assistance News

Owl's LWIR to See Warm Objects at Night

DRIVER ASSISTANCE NEWS



Owl Autonomous Imaging delivers monocular 3D thermal ranging computer vision solutions that enhance safety day or night and in adverse weather conditions, to automotive and industrial mobility markets.

Thermal Ranger™ is Owl's passive 3D sensor solution that uses AI deep learning and custom thermal sensors to extract dense range maps. Owl AI's system approach identifies living objects in all conditions from dense urban environments to completely dark country roads where it is paramount to quickly identify, classify, and determine the distance to an object including all VRUs. This allows autonomous vehicles and vehicle operators to safely navigate and stop to avoid catastrophic damage or injury.

Owl's immersive LWIR thermal imagine experience will be showing thermal solutions in action at CES in Las Vegas.

This new automotive safety technology can see and identify warm objects in total darkness, up to 200m ahead.

General News

China new vehicle release :

GENERAL NEWS



LUXEED S7 officially launched

Recently, the first sedan LUXEED S7 of *Harmony Intelligent Mobility Alliance* (formerly Huawei's smart car business) was officially released.

The front face adopts a closed grille design, and the headlights on both sides integrate functions such as position lights, high and low beam headlights, turn signals, and side air intake curtains. At the rear, it adopts full width taillights.



The LUXEED S7 is jointly built by Huawei and Chery, and is produced based on a new platform built by Huawei's full-stack intelligent vehicle solution.

ARCFOX Alpha T5 officially released

The new model is positioned as a pure electric mid-size SUV and was officially unveiled at the Guangzhou Auto Show.



The VOYAH Chasing Light PHEV launching soon



The front face has a family-style Kunpeng wings spreading design, and the star-diamond grille is matched with wing-type full-width lights.

The rear adopts an end to end taillight design, and a separate light is added above the tailgate lid to make it more recognizable.

ACEA: EV market share will grow 40% in Europe in 2024

GENERAL NEWS



Citroen New e-C3

The market share of battery-electric vehicles in the European Union will grow by 43% next year, driven by a surge of new models, industry association ACEA predicts. The share of BEVs will rise to 20% in 2024 from an expected 14% in 2023, ACEA President Luca de Meo said, although the overall market is forecast to grow only slightly next year.

De Meo, who is CEO of Renault Group, said the launches of affordable vehicles will help to boost EV share. "There will be a product effect from that. We are trying to apply EV powertrains on products that are more mainstream and in the core of the market," said de Meo, citing upcoming small EVs such as the Renault 5. Those cars will use smaller and less expensive batteries, helping to lower prices and increase demand. The Renault 5 will sell for about €25,000, and models from Citroen and Renault will be under 20,000 euros in the next two years.

The overall EU market will grow by about 12 percent this year, said ACEA's director general, Sigrid de Vries, for a total volume of about 10.4 million cars, which is 20% below the 2019 pre-pandemic figure.

Growth in 2024 will be about 2.5 percent, with volume at 10.7 million units, de Vries said. Other analysts, including [ING bank](#) and the Economist Intelligence Unit, have cited similar, low-single-digit figures for Europe.

Isuzu Chairman Replaces Akio Toyoda as JAMA Leader

GENERAL NEWS



Akio Toyoda, right, Isuzu Chairman Masanori Katayama, left

Akio Toyoda is retiring as chairman of the Japan Automobile Manufacturers Association after an unprecedented three-straight terms leading one of the world's biggest, most vibrant automotive industries through a turbulent decade of dramatic and rapid change.

Toyoda, who early this year also stepped down as CEO of Toyota, will be succeeded at the helm of JAMA by Masanori Katayama, chairman of Isuzu Motors..

Katayama's appointment is the first time JAMA's top job will be filled by the boss of a truck maker since the industry group's founding in 1967. The chairmanship of JAMA usually rotates every two years between Japan's three biggest carmakers — Toyota, Nissan and Honda.

As head of the world's largest carmaker and Japan's vast auto sector, Toyoda had a perfect platform to promote the interests of automakers and suppliers around the world. "The role of the Japanese auto industry in the world has changed day by day," he said. "But the automotive industry will have to continue to be an essential industry for this country."

Akio Toyoda was always cognizant of his role in collectively representing 5.5 million employees from 14 of the country's automobile manufacturers. Toyoda presented it as a challenge of guiding the industry through a "once-in-a-century change" as car manufacturers around the world aim to EV.