Tue, 5 November 2024
Weekly Newsletter

DVN Lighting

NEWSLETTER #878

Editorial

A Brilliant Car Lighting Week In China

The 12th International Forum of Automotive Lighting China (IFAL 2024) was held on 17-18 October 2024 in Shanghai Lingang, a new area about 80km south of Shanghai city center on the coast. Lingang is home to the Tesla Gigafactory, as well as many high-tech industries, shipbuilding, aircraft engine and battery manufacturers.

The IFAL conference venue was an impressive and huge new conference center near Lingang Lake. The audience of 450 people was nearly all Chinese due to the Vision conference being held in Paris at the same time. IFAL president and founder Prof Yandan LIN said it was a pity but unavoidable this year, but it shall not happen again.

The title of this year's IFAL was "Vehicle-Mounted Light Environment in Era of AI". To prove the point, all presentations were translated by an AI and projected in Chinese and English on a panel at the top of the very large LED wall. A useful service indeed. At the same time, as usual in China, human translators were available via headset.

China's importance in automotive lighting continues to grow. Close cooperation between science, technology and government is helping to drive further improvements. China is already a leader in ISD ('interactive social/signal displays') and "fun" lighting features, which first appeared with the Audi A7 in 2010 as rear lamp animation (Don't miss the 2024 DVN Study about ISD, coming soon!). Europe is, and will continue to be, the leader in the development of night driving safety technologies like ADB, as the vast majority of car traffic in China takes place within city limits on mostly lit roads.

This week's newsletter is almost entirely about China. China is the most dynamic and exciting market right now for automotive lighting. Very fast, very cost driven (a massacre) and full of bold solutions. See you in Shanghai at the DVN Workshop on 4 and 5 December.

Wolfgang Huhn
DVN Senior Advisor

In Depth Lighting Technology

12th IFAL: Key points & the Founder's View

IFAL Key Points

by Wolfgang Huhn

1. The heart and soul and clear focus of IFAL is science. The majority of the presentations were scientific. Many young scientists took the opportunity to present their results and findings. A nice marketplace for fresh talent.
2. On the topic of regulations and homologation, Bu Weili from SMVIC gave some messages between the lines. It was clear from his presentation that the great freedom in China to use ISD (while driving) and non-standard signaling will be gradually restricted by the authorities. He also announced stricter requirements for light distribution at speeds >70 km/h (per GB4599-2024) and the introduction of a minimum surface area of 15 cm2 for turquoise AV signal lights.
3. Professor Khanh mentioned the importance of demographics in his video presentation. Reduced visual contrast requires improved lighting quality in all areas of life. In traffic, adaptive lighting systems and a holistic communication approach are needed, using real road geometries and object positions.
4. A number of presentations by experts in light sources and set manufacturers showed many detailed improvements such as 45° LEDs for rear lamps (Dominant), microcontroller-less lighting architecture for SDV (OP Mobility), open protocols for dynamic interior lighting (ams Osram), smart laser projectors for concept cars (Appotronix).

12th IFAL From the Founder's View

by Prof. Lin Yandan

On October 17, 2024, the 12th International Forum on Automotive Lighting, China (IFAL 2024) was grandly held in Shanghai. This event was organized under the joint guidance of Department of International Cooperation and Exchange of Ministry of Education, International Liaison Department of China Association for Science and Technology, Lin-gang Special Area Administration of China (Shanghai) Pilot Free Trade Zone, and Fudan University. It was co-hosted by Institute of Optoelectronics of Fudan University, Intelligent Transportation Lighting Committee of China Illuminating Engineering Society, Shanghai Motor Vehicle Inspection Certification & Tech Innovation Center Co., Ltd., Fudan Lin-gang Industrialization Innovation Platform, and Shanghai IFAL Vision Technology Co., Ltd.

Professor Ma Yugang, Vice President of Fudan University and Academician of the Chinese Academy of Sciences; Professor Zhuang Songlin, Academician of the Chinese Academy of Engineering; Liu Zhenglei, Chairman of the China Illuminating Engineering Society; Zhan Yiqiang, Vice Dean of the School of Information Science and Engineering at Fudan University; and Professor Zhang Lihua, Director of the Fudan Lingang Industrialization Innovation Center, attended the opening ceremony of the forum and delivered speeches. More than 400 top experts, scholars, and industry leaders from academia and industry, both domestic and international, participated in the event in person, while several international guests attended online. The opening ceremony was chaired by Professor Lin Yandan, Chair of the IFAL Conference, Director of the Intelligent Transportation Lighting Committee of the China Illuminating Engineering Society, and Professor at Fudan University.

Professor Lin Yandan presided over the opening ceremony

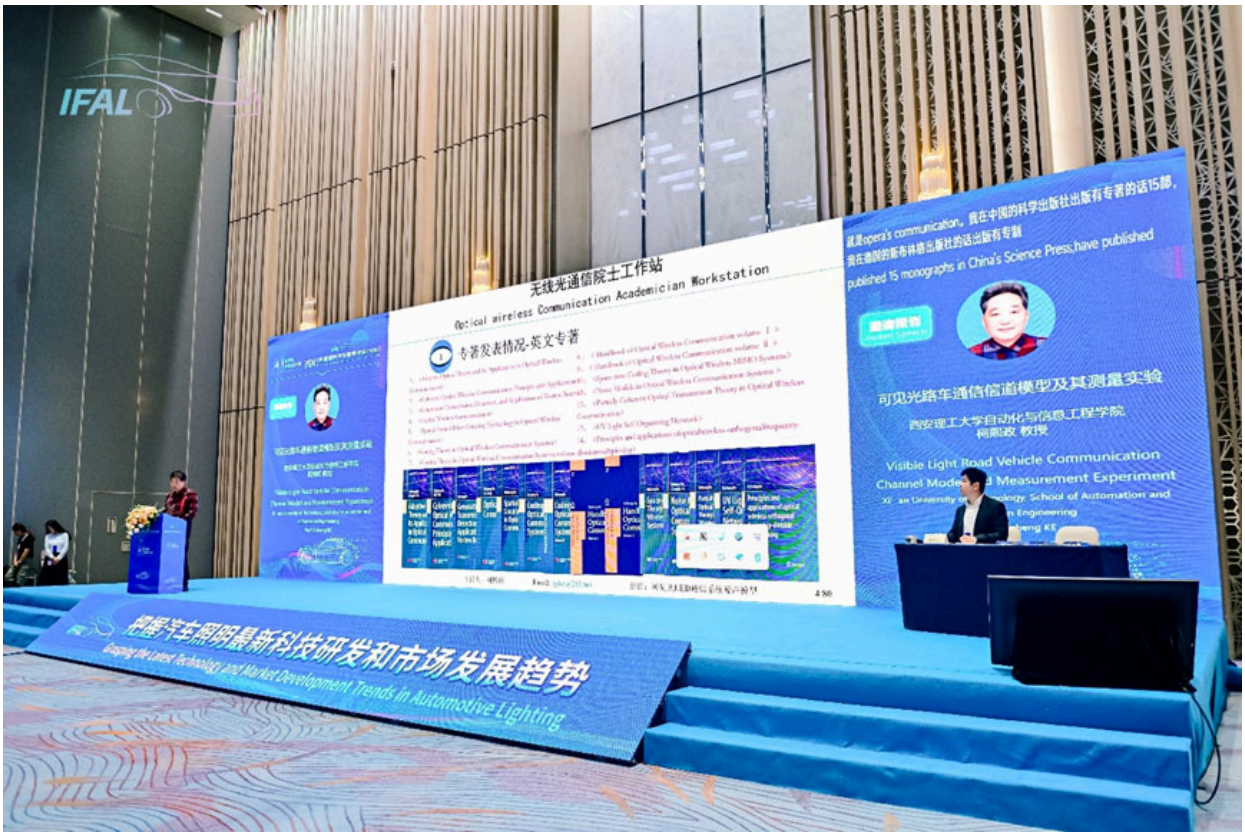
At the invitation of Professor Lin, Professor Kang Jian, a foreign academician of the Chinese Academy of Engineering from University College London, delivered a

presentation titled “Towards Physical Environment Design of Cabins Based on Multi-sensory Interactions.” The report explored in detail how integrating multi-sensory interactions in future cabin designs can enhance passenger comfort and user experience.

Professor Tran Quoc KHANH from the Technical University of Darmstadt in Germany delivered an in-depth report titled “Automotive Lighting Latest Trends—Highlights of Vision Congress 2024.” The report provided a comprehensive outlook on the latest developments from five perspectives: design, safety, sustainability, ADAS lighting, and user experience.

Bu Weili, Secretary General of the Lighting and Signalling Devices Subcommittee of the National Technical Committee of Auto Standardization, delivered a speech titled “Introduction to Three Mandatory National Standards for Automotive Lighting.” He introduced the background of the integration of national standards for motor vehicle lighting, highlighted the differences between the old and new standards and UN regulations, and, for the first time, publicly presented the integrated lighting standard for motorcycles. The speech provided an in-depth understanding of the latest national standards and their alignment with international regulations.

Professor Ke Xizheng from the School of Automation and Information Engineering at Xi’an University of Technology delivered a report titled “Visible Light Road Vehicle Communication Channel Model and Measurement Experiment.” The report explored in depth the potential advantages of improving the efficiency and safety of automotive lighting systems, as well as the future development trends of in-vehicle communication technology.



Driving Vision News (DVN) industry expert Wolfgang HUHN pointed out that external lighting was achieving more intelligent and energy-saving development through LED and laser light sources, as well as dynamic beam adjustment technology. Interior lighting tended towards intelligent dimming and personalized settings, enhancing atmosphere creation and human-computer interaction experience. The latest trends in ECE regulations have driven the continuous upgrading of industry standards, ensuring that technological innovation is synchronized with safety and environmental protection. These advancements had significantly improved the driving experience for users.

Associate Professor Chen Chengming from Shanghai Ocean University presented “Multi-feature Fusion for Driver Fatigue Detection” at the IFAL Forum. He showcased a comprehensive evaluation method that integrates physiological signals, behavioural characteristics, and environmental factors, effectively enhancing driving safety.

This year’s IFAL was themed “In-Vehicle Lighting Environment in the AI Era” and featured six subtopics: “In-Vehicle Light Sources and Innovative Modules,” “Visual and Acoustic Environments and Driving Behaviour,” “Modal Perception and Immersive Interaction,” “Innovative Technologies for Intelligent Headlamps and In-Vehicle Displays,” “Measurement, Evaluation, and Standardization,” and “Optical Innovation Research and Development Tools.” Over the course of the two-day IFAL forum, experts, scholars, and industry representatives from research institutions, standardization organizations, automotive companies, and testing agencies from multiple countries delivered 39 forum presentations focused on these six themes, sparking a wave of exchange on automotive lighting technology.

Experts and scholars from universities such as Fudan University, Dalian University of Technology, Chongqing University, Vrije Universiteit Brussel, Tsinghua University’s Suzhou Automotive Research Institute, Sun Yat-sen University, Anhui Polytechnic University, and leading companies such as Lumileds, Dominant, ams OSRAM, Bio Optoelectronic, Appotronics, SAIC Volkswagen, HASCO Vision Technology, Dongfeng Motor, Hella, Mind Auto Electronics, Fulllightcn, Jingqiao Lingang, Texas Instruments, Gore, Yjoptics, Everfine, Synopsys, PAX Optics, Xingyu Automotive Lighting, COMAC Shanghai Aircraft Design and Research Institute, and others gathered to discuss the latest advancements and the future trends in automotive lighting and display technology. Each themed presentation offered in-depth analyses of technological challenges, innovative solutions, and the process of standardization, providing valuable insights for the industry’s development.

Mind Electronics General Manager Hossein Nafari hosted a roundtable discussion on “Future Opportunities in Automotive Lighting.” Zhang Dapan, Manager of HASCO Vision Technology, led the keynote speech titled “Digital Transformation of Automotive Lighting Design: Dual Empowerment of Aesthetics and Emotional Value,” which invited senior professionals and practitioners from the industry to deeply explore the challenges and opportunities that AI brings to automotive lighting in the current era. Engaging presentations from experts such as Dr. Wolfgang HUHN and Dr. Henning KIEL from DVN, Professor Xu Shijie from Fudan University, Professor Ling Ming from Shanghai University of Engineering Science, Dr. Ao Jinlong from HASCO Vision, Li Gang from Xingyu Automotive Lighting, Huang Yi from Pan Asia Technical Automotive Center, Zhao Heng from Jiyue Auto, and Qu Liang from SAIC Volkswagen provided attendees with valuable industry insights and sparked reflections on the future development of automotive lighting technology.

During the forum, a special field trip was organized for industry experts from China’s leading automotive ecology enterprises and international scholars. The delegation participated in cultural exchange activities at the Lingang Dishui Cloud Hall and toured

the cutting-edge exhibition hall. Through interactive experiences and detailed explanations, participants gained a comprehensive understanding of the latest achievements in technological innovation and green development in the Lingang Special Area. The event not only allowed international scholars to witness China's commitment to advancing high-tech industries but also deepened their understanding of China's technological ecosystem. Furthermore, the cultural exchange served as a key bridge for promoting international technological cooperation, enhancing mutual understanding and friendship.

The IFAL TOUR industry ecological delegation also visited innovative companies and research institutions in the Lingang Special Area, engaging in deep discussions on the latest technologies and market trends in automotive lighting and related fields. This exchange fostered knowledge sharing and technological collaboration between domestic and international peers, injecting new momentum into the continuous innovation and development of China's automotive lighting industry.

The IFAL conference concluded on October 18, with a summary of the latest hot research topics in automotive lighting, presented by the European Vision Congress, which held an academic automotive forum concurrently with IFAL. Conference Chair Professor Lin Yandan announced the IFAL Hot Topics annual research highlights and declared the forum closed, looking forward to the next gathering in Shanghai for IFAL 2025.

This forum not only provided a platform to showcase the latest research and technological developments in the field of automotive lighting but also carried the mission of promoting international scientific and cultural exchange. It attracted young scientists from multiple countries, facilitating exchanges. During the forum, participants engaged in-depth discussions on the latest advancements in AI technology in automotive lighting, market trend analysis, and cutting-edge topics in the field of visual technology, further strengthening collaboration between domestic and international peers to jointly promote innovation and development in automotive lighting.

Submitted by: Intelligent Transportation Lighting Committee, China Illuminating Engineering Society

Lighting News

Audi and DVN visit Catarc

LIGHTING NEWS

In the center: Ivo Muth (L), An Tiecheng (R).

On 9 October, Ivo Muth—newly appointed as head of Audi China R&D—and a small delegation visited Catarc in Tianjin. That's the China Automotive Technology and Research Centre. During their visit, they toured laboratories within Catarc and met with Mr. An Tiecheng, the President and Secretary of the Party, and his Board. Qiong Chen from Audi China and Wolfgang Huhn from DVN also participated in this high-level event, owing to Huhn's previous tenure at Audi and the strong ties between DVN and Catarc, who wrote about the visit on their website.

Anrui visit in Wuhu

LIGHTING NEWS

By Paul-Henri Matha

Anrui is part of a company called San'an, established in November 2000 in Xia'men, China. San'an now employ more than 15,000 people, and produce more than 13 million wafer chips per year. They have four main core business activities: LED, microwave radio frequency, power electronics, and optical technology.

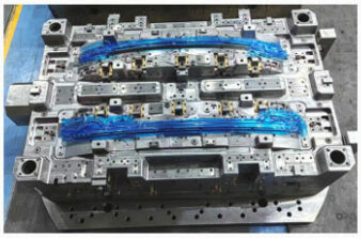
Anrui itself was established in June 2010, with headquarters in Wuhu. There are 2,500 employees—of whom 300 are in the UK, for Anrui bought longtime British car lights maker Wipac in 2019. Anrui have 65 assembly lines, 84 injection moulding machines (61 in China, 23 in Britain) and 12 electronic-component production lines.

The company's factories for tooling, LED packaging, PCB assembly, and lamp assembly are in Wuhu, Anhui, Taizhou, Zhejiang, Chongqing, China, and in Buckingham, England.

LED Packaging

PCB Assembly

Module, Electronic and Optic sub-assembly



Tooling manufacturing

Die Spotting Machine

Coordinate Measuring Machine

Injection Molding

Pretreatment

Assembly

R&D efforts are done by 450 engineers, including 50 at Wipac in England, and 100 in the tool shop. Testing including EMC is possible in-house with full equipment.

Anrui make their own LEDs; 80 per cent of their wafers come from San'an, and the other 20 per cent from other LED makers.

Production capacity is 3.4 million sets per year: 1.5 million in Wuhu, 1.5 million in Chongqing, 0.4 million in England. Current ratio is 40 per cent headlamps, 40 per cent rear lamps, and 20 per cent small lamps.

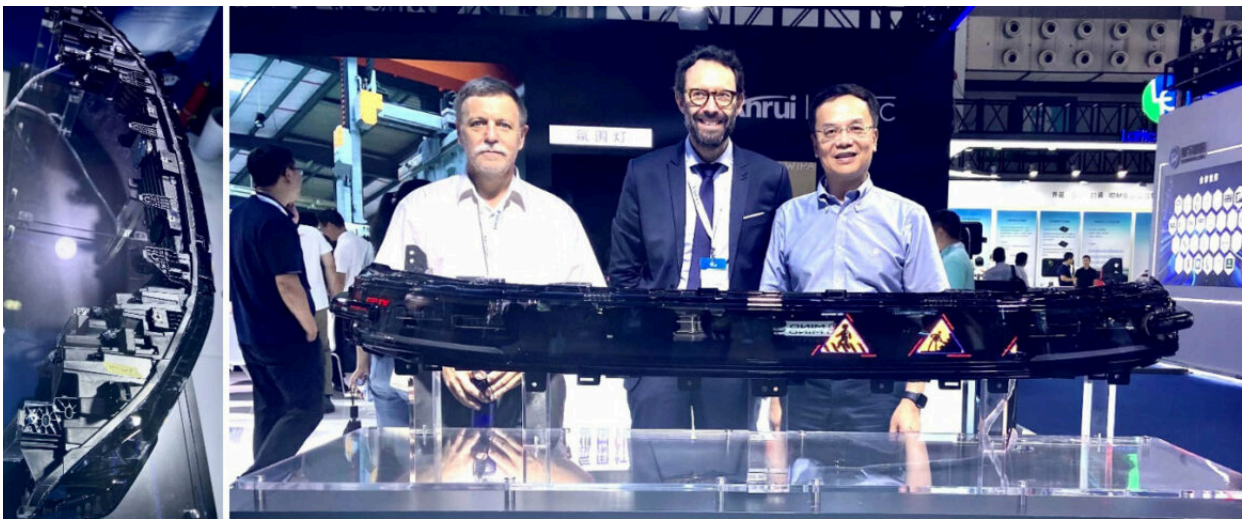
Main customers are Chery, ChangAn, Geely, Dongfeng, Seres, Peugeot, Bentley, Aston Martin, Ferrari, McLaren and Porsche.

The production plants are at a premium level. Equipment and facilities include pressure control and full ESD protection; hotplate welding including IT treatment and laser welding; robots for venting position and final leakage test; and a 3.3-ton injection machine including 4K injection for lenses.

During ALE in June 2024, Anrui exhibited the ChangAn CD701 headlamp including RGB miniLED technology:

- 38,400 LED chips with 5 miniLED displays (128 × 60 pixels on each screen)
- Resolution 1.5mm
- Luminance 5,000 cd/m^2

- Maximum power consumption per screen is 22 watts (metal frame carrier behind each screen)



Anrui boast of commitment to providing vehicle lighting system solutions for the world's automakers. Based on current global automotive industry trends, Anrui have decided to accelerate the pace of their global layout and expand its overseas manufacturing capabilities in the short term.

Refond Products Launched in Zeekr 7X

LIGHTING NEWS

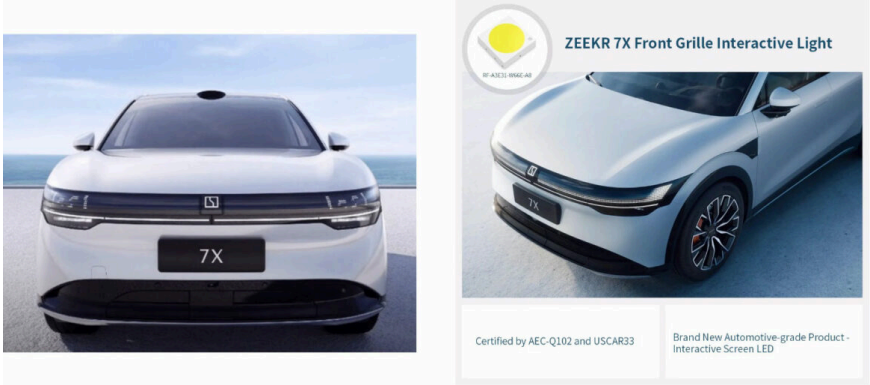
Refond Optoelectronics has provided automotive-grade LEDs and an innovative miniLED backlight, contributing to the creation of the newly upgraded Zeekr Stargate all-in-one 'smart' light screen, along with a new 16-inch miniLED central control screen application, enhancing both the technological feel and display effects.

The newly launched Zeekr 7X features a standout highlight in its cockpit: a 16-inch floating miniLED display with 3.5K resolution and an impressive screen-to-body ratio of 88.4 per cent. It is built withRefond's miniLED COB backlight board, which gives high brightness, high contrast, and a wide colour gamut with NTSC 110%.

Refond have upgraded traditional surface light sources topixel-level point light sources based on QD miniLED technology, achieving precise light control at the pixel level.

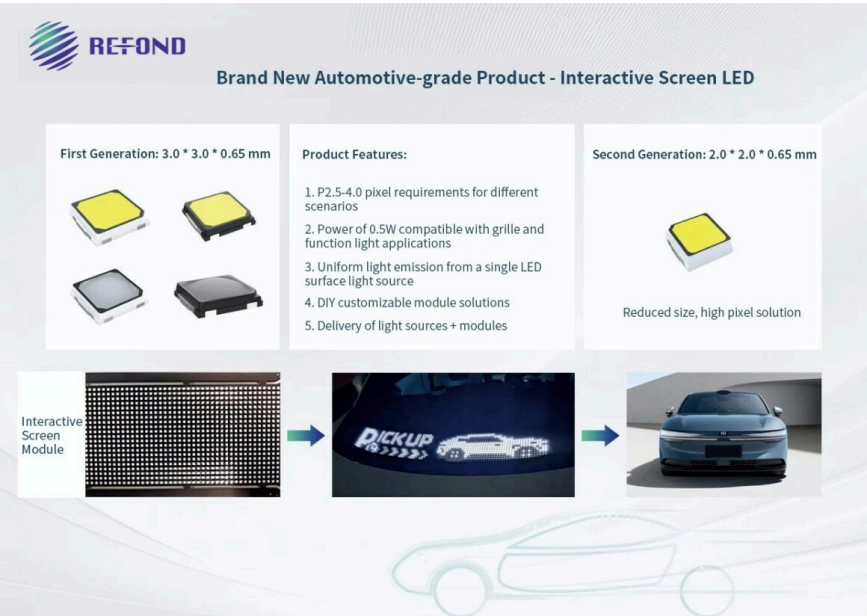
And they have launchedthe first mass-produced QD miniLED vehicle technology in China. This offers superior optical blending effects, clearer display details, and richer brightness and darkness levels, ensuring the display maintains exceptional picture quality in both bright and nighttime driving conditions.

Exterior design wise, the Zeekr 7X continues the latest familial seamless light curtain and 'Hidden Energy' design language.



Refond's automotive LED lamp bead products have contributed to the integrated light curtain design of the grille. This features the world's largest 93-inch giant light strip, which incorporates 1,831 high-power lamp beads and boasts a 310° ultra-wide viewing angle. This is yet another mass-produced achievement from Refond following their assistance with the Zeekr 007 smart light curtain.

In response to the application of this integrated smart light curtain, Refond recently launched interactive screen LED module products. Each LED surface light source emits light evenly, making a visual effect of visible light from an invisible lamp. Through clear pixelated patterns, it provides users with a highly technological interaction experience.



Cute Lights on Geely Xingyuan

LIGHTING NEWS

Geely's new Xingyuan was officially launched on 9 October. The completely new model is positioned as an A0-class electric sedan, with a five-door, five-seat hatchback layout. The price range is C¥70,000 to C¥100,000 (~$10,000 to $14,000 or to €9,000 to €13,000).

The car has a new design language, with smooth and rounded overall lines and a cute look. There is a closed grille design, triangular LED headlamps, with automatic switching of high and low beams

The headlamps have a blackout treatment, and the well-designed lens structure inside contributes to the car's overall design.

The LED light strip provides position lights, turn signals, and perhaps daytime running lights, though it is not known if DRLs are actually present.

Geely Galaxy Starship 7

LIGHTING NEWS

Geely have released official pictures of their Galaxy Starship 7 SUV. It has a double-nose design with separated front light functions and a full-width light strip. The position/daytime running lights are above, along with a complex lighting structure on both sides of the light strip, which is quite recognizable when lit. Under the nose is a large area of closed panels, and the two sides hide compact high and low beams with a clever connection to the longitudinal air intake and trapezoidal lower grille, participating in the layering of the entire front face.

The shape of the full-width light strip is similar to that of the Galaxy L7. The air ducts on both sides of the front envelope of the new model are connected with the trapezoidal grille below through lines, forming an X-shape, which is a bit like the Galaxy E5.

There's a full-width rear light strip as well, with a dotted centre section and trim, tidy fish-hook left and right extents forming the (regulatory) tail lights.

Valeo @ 2024 Gasgoo Jinji Awards

LIGHTING NEWS

Valeo won two Gasgoo Jinji Awards this year. Valeo's China President, Zhou Song, was crowned 2024 Influential Person in China's Automotive Industry. And Valeo Special Lighting Systems Foshan was honoured as one of the 2024 China's Top 100 Automotive New Supply Chains, for their Dynamic Intelligent LED Interior Ambient Lighting.