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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

LA Auto Show Report Goes Live For The Holidays



We at Driving Vision News wish you, your family, and your teammates a perfect season for all the holidays you're celebrating. Relax and enjoy yourself to the max!

Today we publish our DVN Report on the Los Angeles Auto Show. In it, you'll find focussed coverage of the lighting on 80 different vehicles with 300 colourful, annotated photos.

The show was packed with surprises, starting with its size and scope: two big halls, well filled with vehicles from most established marques and some intriguing new ones.

Lighting has been centrally elevated in vehicle exterior design and style, pushed by new technologies and techniques and pulled by new demands and expectations. Slimline lights aren't the only active trend; there was great variety in the design, configuration, packaging, and light styling on the show cars. Some of the lights were very much the opposite of slim or linear. Hidden headlamps are back, in their own modern way. There's a lot of branding built into lights, as automakers leverage the light-as-new-chrome phenomenon (sometimes quite literally, as you will see in the report).

I greatly enjoyed crafting this report for you, and all of us on the DVN team cordially invite you to get it today, [here](#) on the DVN website.

Remind to Register now for the Paris Workshop and watch the [video of Andre Hainzmaier](#) - Audi, to know more about his Lecture.

Daniel Stern
DVN Chief Editor

In Depth Lighting Technology

Lights at the LA Auto Show



The Los Angeles auto show this year was one surprise after another—almost all of them favourable. A few automakers were absent, but most established and new marques were on display. The show filled two big halls and felt much like a good old full-scale pre-pandemic event.

There was tremendous variety in design and configuration; lighting has gained great traction as the primary main vehicle exterior design and style anchor. That stands to reason, in context of the tight constraints exerted on most other aspects of vehicle design by aerodynamic and regulatory considerations. Of course, there are also regulatory constraints on lights, some of them worth grumbling about because they serve only to block American motorists from enjoying the safety performance and style of lights allowed everywhere else. Nevertheless, the vehicles on display in LA showed that lighting engineers and designers are stretching their imaginations in new directions.

Some overspanning themes we noticed:

- The small number of halogen headlamps was notable for the first time in over half a century; the last time, in the mid-1960s, it was a new technology just on the way in and up; this time it's an old technology on the way out and down.
- Hidden headlamps are back, in a modern way. They used to be mechanically hidden behind doors or in fold-away housings; now they're discreetly hidden optics in blacked-out compartments, often recessed and placed down low in the bumper fascia.
- There's more and more branding in lights, with words and symbols. Examples include Chevrolet's bowtie-shaped side marker lights, and Lordstown's "LMC LED" taillights.
- Amber turn signals and side turn signal repeaters are still fashion choices rather than basic safety equipment on the North American regulatory island, and progressive illumination of turn signals is prohibited no matter what colour they are, despite research demonstrating a significant conspicuity benefit. So, automakers light the whole turn signal all at once, then progressively extinguish it—no conspicuity benefit over regular turn signals, but on the other hand it's not prohibited.

Trends Exemplified at LA Auto Show



Chevrolet Equinox

Full-width slim light bar; illuminated emblem, and hidden headlamps



Dodge Charger SRT

Light frame around grilleboard; lit logo, and hidden headlamps.



Innovative Appearance:



Genesis G90

Sugarcubes lined up in two rows; those for the DRL, position, and turn signal interspersed with the ones for the headlight beams. Dual light strips wrap around and provide side marker light and reflector before skipping past the wheel arch and continuing aftward to provide the side turn signal repeaters.

Styling Influence:



Dodge Charger SRT Concept

Stylish double-line full-wrap light band, with illuminated logo in the middle. A modern interpretation of the original 1966 Dodge Charger full-width taillight (but now with LEDs—much lower wattage!)



Genesis G90:

Twin-stripe theme. Upper band widens at the ends to flow into the main tail lights

Lighting News

ADB, MiniLEDs Drive Vehicle LED Growth *Adapted from LEDInside magazine*

LIGHTING NEWS



According to the 2022 Global Automotive LED Product Trend and Regional Market Analysis released by TrendForce, the increasing uptake of LED headlamps and the development of new lighting functions; lit logos, and new ambient lights—among other advanced technologies—bolstered the automotive lighting market in 2022.

Global automotive lighting market scale (TrendForce)

Year	2021	2022	2023	2024	2025	2026
Market \$	31.4bn	32.7bn	34.3bn	35.9bn	37.5bn	39.5bn

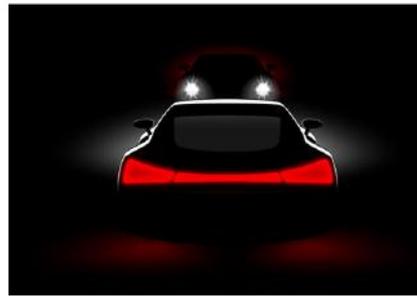
TrendForce estimate the global prevalence of LED headlamps in new passenger vehicles will hit 72 per cent in 2022, and as high as 92 per cent for EVs.

ADB brings μ LED pixel arrays with 10 to 30 kpx, precisely and individually controlled for flexible illumination areas to boost safety and meet regulatory requirements. ADB uptake is expected to hit 14 per cent in 2026, driving the overall vehicle lighting market to USD \$39.5bn.

Signal lights create personalised design with dynamic pictures; warning messages, and traffic information for safe driving.



STRIP FULL-WIDTH TAIL LIGHT



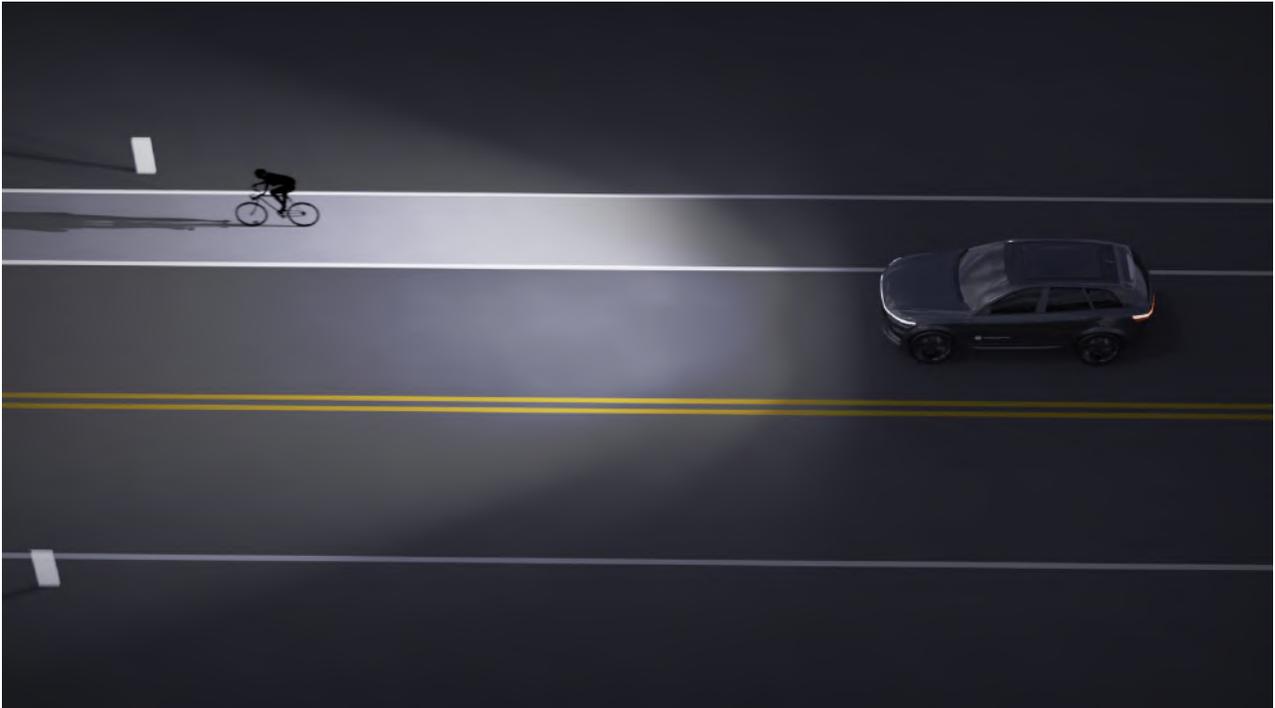
BAND FULL-WIDTH TAIL LIGHT

Full-width light bands can perform welcome/farewell animations, among other functions. Premium designs can control each pixel individually to create a dynamic light dance to help the driver find their vehicle in a parking lot, and show off the money they spent on the vehicle.

Automakers; lighting suppliers, and LED and driver suppliers are developing illuminated logos; ambient lighting, and light-signal projection technology. As automakers continue to introduce amazing innovations and thinking in lighting, its future is extra super bright!

Hella's Growing Strength in Chip-Based Headlamps

LIGHTING NEWS



Hella continue to expand their leading position in digital, chip-based headlamp systems. They've started the world's first series production for their Solid State Lighting | High Definition headlamp at their Lippstadt site, and have received high-volume series orders for this technology from German and international premium car manufacturers—orders totalling around €1.5bn.

Hella's lighting managing director Yves Andres says "The market launch of our SSL | HD headlamps is another milestone in automotive lighting technology, with which we are setting completely new standards in terms of performance, functionality and cost efficiency (...) we relied on SSL | HD technology for high-resolution headlamps at an early stage and have consistently driven its development ever since. On this foundation, we have established a market-leading position, which we are continuously expanding outwards with further customer orders and the next generation of products".

The SSL | HD headlamp is an evolutionary development of established LED matrix systems. Up to 25 kilopixels per LED can be switched individually, depending on customer requirements. Thus, a multitude of new, high-resolution lighting functionalities can be realised. These include lane markings, symbol projections as well as lane brightening and light carpets. Other safety-enhancing functions can be provided as well, such as projections of safety distances or protection zones for cyclists or pedestrians.

Three New Chinese Models

LIGHTING NEWS



Changan Deepal Dark Blue S7



The second model of Changan's Deepal brand may be designated the Dark Blue S7. It's consistent with the SL03's design, with slim headlamps, and a full-width rear light bar, with petal-design tail lights.

SAIC Rising F7



The Rising F7 adopts a closed front face, with particularly sharp-lined headlamp design. Angular style is also present at the rear, with brand-familial design.

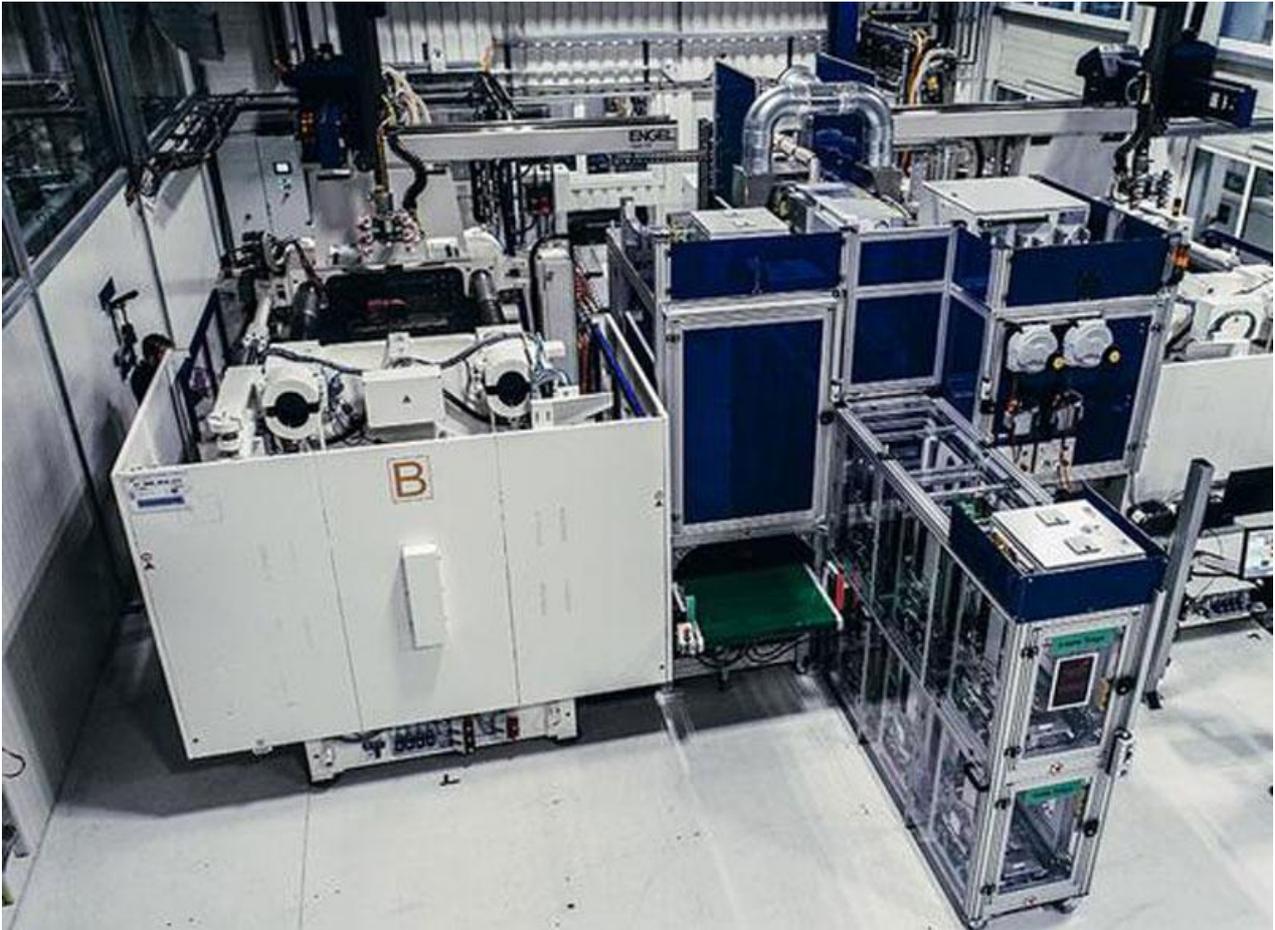
Nio ES8



The front of the new Nio ES8 has the latest family style: widely-separated lighting components, slim LED DRLs, and the outer contour of the headlamp gets a silver trim. There's a full-width light band with a blackout unlit appearance. On the roof there's a single lidar unit and two 8-megapixel HD cameras, and sideview cameras on the front fenders augment the door-mounted side mirrors.

ZKW Win German Design Plaudit

LIGHTING NEWS



ZKW's Black Box robot station has been awarded a Special Mention in the German Design Awards. The Black Box is a fully automated handling; inspection, and packaging system for optical parts; it's used for simplified, automated headlamp lens processing and quality inspection, for example. The Black Box can simultaneously process and inspect different kinds of lenses without changeover downtime. It was developed together with two partners and helps to increase quality; efficiency; safety, and competitiveness.

The German Design Award is the premium prize of the German Design Council. Every year, submissions in product design, communication design and architecture are selected in the segments Excellent Product Design; Excellent Communications Design, and Excellent Architecture.

Asahi Kasei's AKXY2 Concept at CES 2023

LIGHTING NEWS



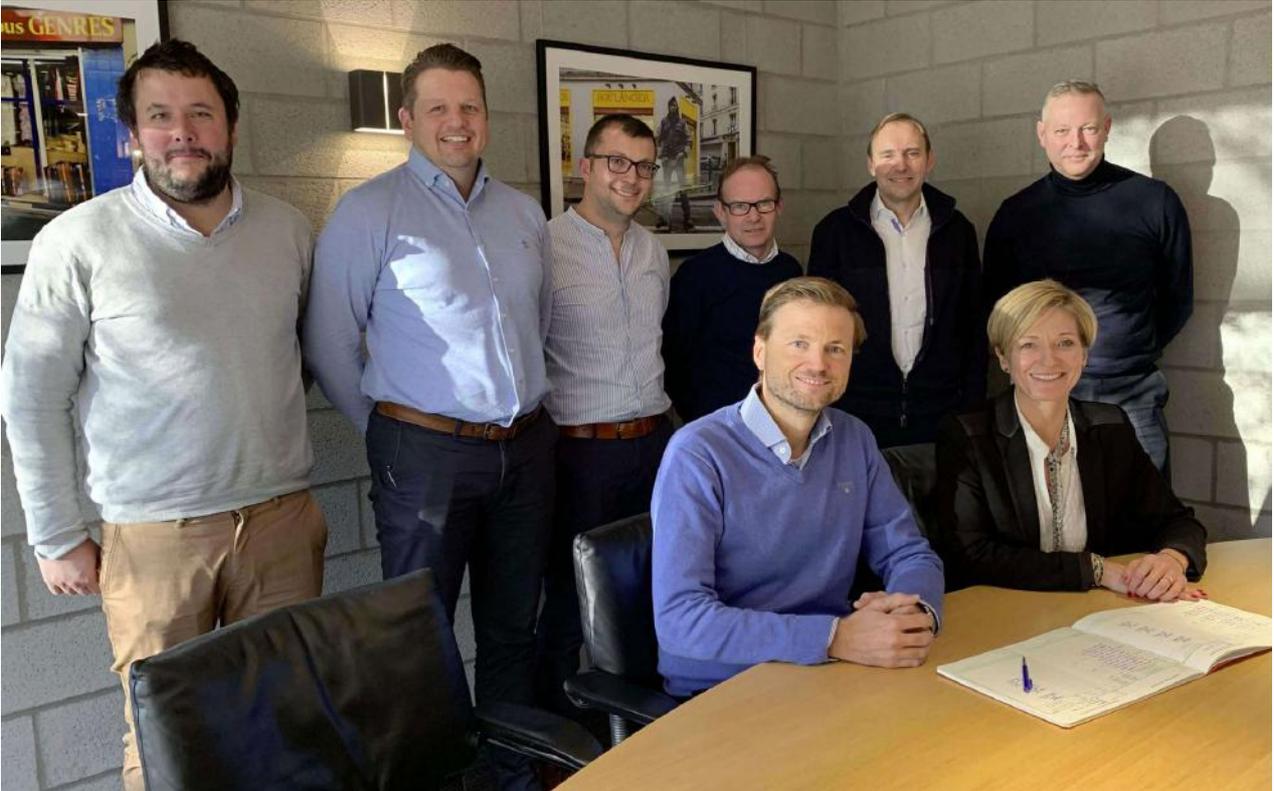
Over a century's worth of Asahi Kasei innovation is represented in the AKXY2 concept car they'll bring to CES next month, showcasing solutions for the entire automotive value chain—from raw materials and production technologies to the usage of recycled and recyclable materials.

The AKXY2 has technology that touches the senses and ensures the highest functionality while proposing solutions to reduce the environmental impact of automobiles. From textiles and engineering plastics to elastomers, Asahi Kasei materials contribute to a lower carbon footprint. The interior surfaces are covered in Dinamica®, a premium microfibre resembling suede, made with recycled polyester. The cabin's built-in CO2 sensor helps provide optimal interior air quality while reducing energy usage to extend the EV's drive range.

The concept collects the evolving needs of car occupants into themes of sustainability; satisfaction, and society to change how cars will more thoroughly integrate into our lives. The car will become more than just a means of transport—it will be a place to socialise with friends and family. With more than 46,000 employees around the world, Asahi Kasei contribute to a sustainable society by providing solutions to the world's challenges through their Material; Homes, and Health Care business units.

Riou Glass Buy Majority of Glass Invest

LIGHTING NEWS



Riou Glass, who specialise in insulative glazing with high energy and environmental performance, have acquired a majority stake in Belgian holding company Glass Invest, who own Euroglas-De Landsheer; Safetyglass, and Industrial Glass Processing. The objective of the buy-in is to create industrial and commercial synergies between the two glassmakers in France and Belgium.

Created in 1964, Glass Invest are a major processor of flat glass, specialising in tempered and laminated products for the likes of doors; partitions, and shower screens; and associated accessories for the construction and decoration sectors. They have grown by dint of Euroglas-De Landsheer's purchase of Safetyglass in 2006, then of IGP at the end of 2017. Euroglas-De Landsheer now achieve a consolidated turnover of more than €31m (2021) and have 160 employees.

The objective of the two glassmakers joining is to achieve industrial and commercial synergies to develop their respective activities, in particular through the marketing of the Riou Glass range in Belgium and the tempered and laminated glass offer in France. Riou president Christine Riou Feron says "With Euroglas, we share family values and industrial know-how that is both common and complementary. This meeting between our two companies will allow us to co-build the future together, by learning from each other's best practices".

Driver Assistance News

Luminar Iris lidar in '24 Volvo EX90

DRIVER ASSISTANCE NEWS



Volvo's electric EX90 will go on sale in 2024 with all the hardware required for L^4 self-driving. The system's linchpin is the first rooftop-mounted lidar unit on an international-market passenger vehicle —Luminar's Iris. It's a semi-solid-state system, which scans using larger macro mirrors rather than the micromirrors found in a MEMS configuration. Its light source is a 1,550-nm fibre laser, the longer wavelength (vs. more typical 905-nm lasers) being harmless to the human eye. The lidar's receiver uses indium gallium arsenide (InGaAs) microchip technology rather than silicon, and claimed resolution is greater than 300 points per square degree.

The Iris uses pulsed, time of flight target illumination that Luminar engineers claim delivers an exceptionally fast measurement rate, an immediate understanding of reflectance, and no speed-dependent range error. The lidar itself has a 120° field of view and a 26° dynamic vertical.

The Luminar Iris can detect and classify objects to a maximum range of 600m, even at night, and can spot a pedestrian or animal darting across the road at up to 250m. It can "see" an errant tire in the road, or other small objects, at up to 120m. And where the acuity of laser-based vision systems typically degrades in snow or rain, the Iris technology does so very gradually. "You might lose some light energy when lidar hits snowflakes, but you still get enough back to get a useful, fundamentally 3D image," according to Luminar.

Based on their 50-year database of real-world accidents, Volvo say the lidar-based sensor suite will reduce serious-injury crashes by up to 20 per cent and cut overall crashes by 10 per cent.

The Iris lidar is elegantly integrated into the EX90's front roofline, where it resembles a small hood scoop shielded by a transparent cover. The teardrop-shaped unit is sculpted to allow airflow to pass over and reattach to the roof, creating as little turbulence as possible. Water nozzles at the end of the EX90's windshield wipers clean the lidar's protective screen as they sweep near the roof. Two other nozzles clean side-facing fisheye cameras embedded in exterior mirrors to greatly expand views through road junctions.

"We see the lidar as a symbol of 21st century automotive safety, like our three-point seatbelt was in the 20th century," said a Volvo spokesman. Volvo will integrate the roof-mounted sensor on other models built on its SPA2 platform, including the South Carolina-built Polestar 3 from Volvo's new EV division. Luminar have progressively lowered automakers' price for the Iris system to between USD \$500 and \$1,000.

Aeva's 4D Lidar at CES

DRIVER ASSISTANCE NEWS



At CES next month, Aeva will demonstrate their award-winning 4D Lidar technology for the automotive industry. It directly measures not just the 3D position of each detection point, but also its velocity. Aeva's proprietary velocity data provides AVs with information on how fast objects are moving, bringing an added dimension of safety and reliability.

Demo drives hosted by Aeva will tour the streets of Las Vegas with real-time point cloud visualisations of 4D Lidar data, showcasing the additional benefits of Aeva's technology—long range performance, extremely high resolution, and immunity to interference.

Aeva's 4D Lidar-on-chip technology incorporates all key sensor components onto a silicon photonics module. The compact design uses no fibre optics, facilitating a highly-automated manufacturing process to meet the sensing and perception needs of a wide variety of automation applications at scale.

General News

Ford's Fully Software-Driven EV Architecture

GENERAL NEWS



Ford CEO Jim Farley says he is "really excited" about his company's architecture for future EVs that is fully software-configurable. "It's our first architecture that will be 100% updatable by software" he says. Software has become an essential part of the automotive industry, and Farley has prioritised in-house development of the systems and subsystems needed in context of the CASE megatrends, rather than shopping outside suppliers.



Ford are transmogrifying their business; they've separated their combustion-engine and electric-vehicle operations. Along with that, they've been hiring software engineers and related staff to develop EVs; AI, and AV systems. At the same time, they've cut 8,000 workers and 2,000 salaried staffers in their combustion-vehicle business.

Ford plan to produce over two million electric vehicles annually by 2026, just under three model years from now. The general expectation is for BEVs to account for half of new-car sales by 2030, the target set by the U.S. Biden Administration.

Audi, Porsche Execs Gain New VW Group Roles

GENERAL NEWS



VW Group have appointed new chiefs for their quality and design divisions to speed up decision making and improve coordination among the VW; Audi, and Porsche brands.

Michael Neumayer will be in charge of VW Group's quality management division while retaining his position as Audi's head of quality, and **Michael Mauer** (photo) will become VW Group design chief, while also retaining the same role at Porsche. The new structures are an effort to streamline prioritising and quicken implementation of decisions taken on backdrop of upheaval and disruption in the auto industry.

The management reshuffle follows a leadership restructuring announced by new VW Group CEO Oliver Blume this past September. All key functions have now been assigned to the group's leading brands. VW brand oversee group production and procurement; Audi are in charge of group sales and quality, and Porsche will lead design and development. Managing the key functions of quality and design via the Audi and Porsche brands also will allow VW Group to intensify their customer focus, Blume said.