



Editorial

After DVN-I Workshop, More DVN Events In The Works!

We worked very hard to organise and put on the online DVN-I Workshop. It was a wonderful experience and we learned a lot; 200 attendees and 13 exhibitors were present with a very positive feedback. We note with interest that most of the attendees were *not* (yet!) DVN or DVN-I members; we take this as evidence that there's ample room for our communities to carry on growing.

Workshops will be held online for at least the next six months, we reckon, and we are equipped and ready to optimise and produce a fine slate of forthcoming events, to include (soonest first):

- Our third [DVN lidar conference](#), normally organised as a face-to-face event in Frankfurt, but this time online, on November 17, 2020 with 25 lectures from the likes of Audi, PSA, Volvo; Continental, Koito, Marelli AL, ZF, ZKW, Valeo; Aixemtec, Cepton, IBEO, Innoviz, Jenoptik, Osram Opto, OQmented, Ouster, Velodyne, Xenomatix; Fraunhofer IMS, and Yole Development. This online event will gather over 300 top worldwide experts in automotive lidar and lighting from over 150 companies in Europe, Japan, Korea, China, and the Americas. Exhibitors will use virtual booths to present their newest innovations in lidar-based automotive technologies. Register [HERE](#)
- After the lidar Conference, we will hold a [DVN online Workshop](#)—our 21st!—in place of the DVN Tokyo Workshop. We'll publish information soon, but you'll want to save the date, the 2nd of December; it will surely be a top-flight event with active participation by the world's greatest experts in lighting.



We remind you of the tremendous new [DVN Study on new lighting functions](#) in the foreseeable, plannable timeframe. Its analytical description is really irreplaceable for those who need to understand the coming technologies and techniques clearly, and for those tasked with planning strategy in this field. [Arrange to get your copy](#) at your first opportunity, if you haven't already, and watch for the brochure coming soon.

Sincerely yours

A handwritten signature in black ink, appearing to read "J. Frally". The signature is written in a cursive, slightly slanted style.

DVN PRESIDENT

In Depth Lighting Technology

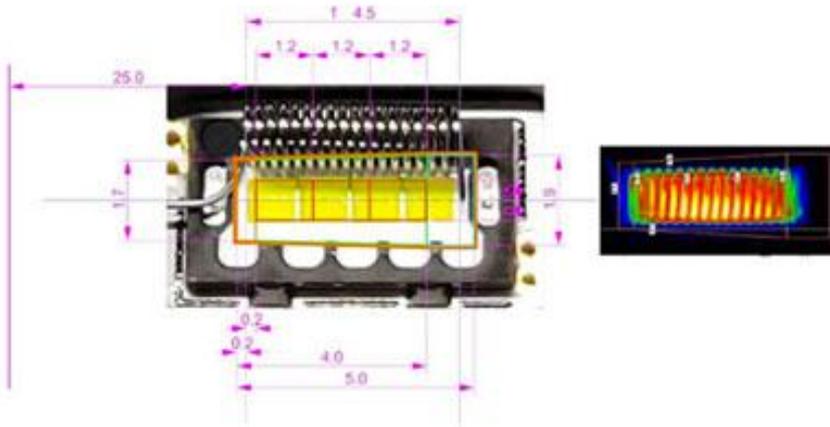
ADB, LEDs at SAE Meetings; Osram LED Bulb OK'd by Germany

The SAE Lighting System Group held their Autumn meeting last week. As with so many other events routinely held in person, the meetings were moved online and conducted via WebEx—convenient, efficient, and inexpensive for participants who didn't have to pay for plane tickets and hotel rooms, and the meetings ran smoothly, though some participants expressed regret at being unable to interact in person.

The meetings, which spanned two days' time, covered the usual docket of committees and task forces as the group discussed needed, wanted, and proposed changes to the many lighting-related SAE J-Standards. There was discussion, for example, of how to resolve the conflict between J2442 coming due for its five-year update, and the ongoing restructure of the UN Regulations on lighting. J2442 lays out how to configure a vehicle lighting system so that it will be acceptable all over the world despite differing local regulations, and identifies and describes the windows of overlap that exist for each function's installation. It also calls out those areas not yet sufficiently harmonised, so that they can be given increased attention. The document must be updated to keep up with the SAE 5-year plan, but because it inherently must make numerous references to UN Regulations, which are in flux, there are different opinions on how to proceed. A thoughtful discussion yielded a variety of strategies to minimise the document's delay and obsolescence.

During the meetings, there was something between a substantial rumour and a knowledgeable report that NHTSA will be issuing their Final Rule on ADB this month—and that it will not hew to either SAE J3069 or to UN R48/R123 ADB. That suggests the Final Rule might make a lot of people dismayed and frustrated, but there's no use crying over milk that has not yet been spilt, so let us hope for a thoughtful, appropriate rule from NHTSA. In any event, we will analyse whatever rule comes forth once it comes forth.

There was further discussion of how best to specify performance from reversing lamps so that they not only warn nearby people that the vehicle is backing up, but also provide an adequate amount and distribution of light for rear-vision cameras now mandatory on new vehicles in the US, and widely installed elsewhere even in the absence of a mandate. Factors such as reversing lamp mount height and photometry were discussed, and thorny technical knots were grappled with—such as whether and how to suggest, in J593 (SAE's reversing lamp standard), that admixture of red light from stop-tail lights can make problems for clear imaging by rear-vision camera/display systems.



Another highly interesting subject at the meeting was that of LED retrofits for halogen headlight bulbs. Extensive work is ongoing toward the development of J3145, SAE's first-ever standard for such replacement light sources—just as similar activities are under way within the technical standards development sphere in the UN Regulatory world. New voices were heard from during these SAE meetings, as certain high-end aftermarket LED bulb makers were invited to share their perspective and expertise. Some of these companies have been doing intriguing work not only on optimising the optical compatibility of their LED bulbs with headlamps meant to take halogen bulbs, but also on other aspects of compatibility.

For example, many vehicles in North America have DRL implemented as reduced-intensity operation of the low beam or high beam headlamps. That works fine with halogen bulbs, which exhibit a nonlinear but predictable change in light output with changes in voltage input. But headlamp LEDs, isolated from line voltage by their driver circuitry, are usually programmed to provide design intensity across a range of input voltage, and they don't react predictably to modified input—whether it be by altered PWM, resistive voltage dropping, or another method. Aftermarket-specialty companies are now devising LED bulbs with smart drivers that can discern a vehicle's call for headlamps versus for DRLs and power the LEDs accordingly to provide an appropriate level of output for the requested function.



And just a day after the end of the SAE Lighting Meeting, Osram announced that one of their LED bulbs has won national approval in Germany for on-road use in certain

specific headlamps on certain specific cars. It's the new version of their LEDriving H7 LED bulb, and the headlamps on the list, when equipped with it, perform in accord with UN R112. The approval is valid only within Germany because these bulbs aren't homologated to any UN Regulation—there is not yet any mechanism by which they could be. Osram have put up a [website](#) (link goes to English translation; original is in German only, naturally, given the Germany-specific approval) describing the new bulb and its legal approval. The compatibility list so far includes seven headlamps used on 12 vehicle models from Audi, BMW, Fiat, Ford, Opel, and Peugeot; Osram say the list will be expanded as further tests are carried out. Some of the approved headlamps use reflector optics type—generally a difficult kind of headlamp to get proper beam patterns from with a type of light source other than the intended one.

A note on the [Amazon page](#) for the new bulb states that it is to be released for sale on 6 October, and that driving in left-hand traffic (as when visiting the UK) requires switching back to halogen bulbs.

Lighting News

Hella High-Res Digital Light Has Over 30 Kilopixels

LIGHTING NEWS



Hella's new "Digital Light SSL/HD" system has more than 30,000 pixels, each of which can be individually controlled to build highly performant, shape-shifting beams and a wide array of new lighting functions functions—like optical lane markings, for example:



These lane lines made of light can show the driver the optimum lanepath for driving past road construction or large vehicles, providing support to achieve safe and stable vehicle guidance. Another safety-enhancing functionality with the new high-resolution lights is the projection of protection areas for cyclists and pedestrians.

The SSL/HD system is another building block for Hella to offer automakers the option of freely programming lighting functions or developing new business models on a pay-per-use or subscription basis—wherein a catalogue of lighting functions are

programmed and onboard the vehicle, but are only enabled once the vehicle "buyer" pays additional money for them.

Hella describe Digital Light SSL/HD is a further development and miniaturisation of existing matrix LED systems. There's an enlarged light-emitting surface, and the over-30-kilopixel flexibility is generated with light sources just the size of a fingernail. This means greater efficiency and flexibility in design, styling, and functional roster. Series production is slated to start in 2022; in the meantime Hella have put up a [promotional video](#) about the new system.

Three OLED Taillight Signatures on New Audi Q5

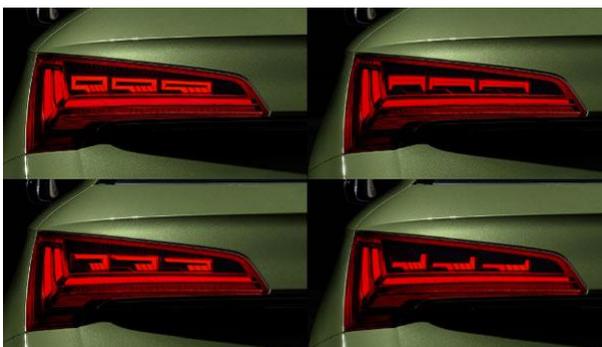
LIGHTING NEWS



Audi's newest Q5 has a rear light cluster featuring digital OLED technology for the first time worldwide. The upper section of the LED headlamps features a new signature for the daytime running lights, as well.



The optional OLED taillights' homogenous light surface is divided into three tiles of six segments each, which enables Audi designers and developers to create different light designs and signatures from a single hardware assembly. When ordering their Q5, customers can choose from three rear-light signatures, each with its own specific designs for the welcome and farewell animation. When the driver selects "Dynamic" drive mode, the taillights change to yet another signature, and the taillamp cluster has a proximity detection: If a road user approaches a stationary Q5 from the rear to within less than two metres, all the OLED segments light up.



Audi is becoming more digital: for the first time, customers have the option of booking certain functions even after they have bought the car. The manufacturer is marketing this feature as an opportunity to individualise the car.

These services, called Functions on Demand, are booked via Audi's digital platform myAudi. Previously, customers had to configure optional equipment when ordering a car. From now on, there is also the additional option of flexibly activating functions in the areas of lighting, driver assistance and infotainment after the purchase or reloading them via OTA transfer. The prices for this are based on the price list for the corresponding conventional options. The functions can be booked for a one-month test phase.

With the Q5, customers can upgrade the LED headlamps to matrix LED headlamps with automatic main beam as part of the Light package..

A Look at the Lights on Nissan's Z Proto Concept

LIGHTING NEWS

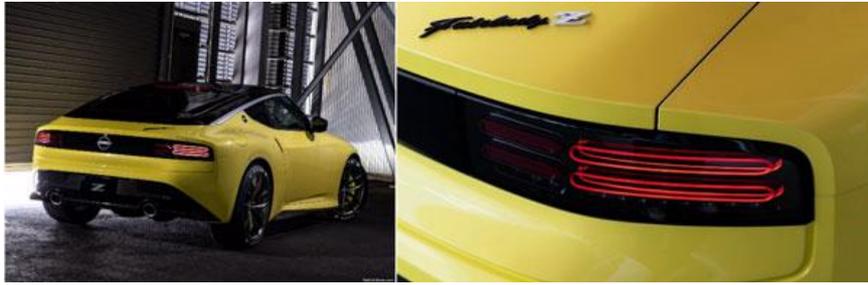


Nissan's Z Proto concept car hints at the company's intent to launch a new generation of the legendary Z sports car. The prototype features new design inside and out, as well as an upgraded powertrain with a manual transmission.



Nissan's design boss Alfonso Albaisa says "The LED headlights have two half-circles that hark back to the Japan-market-only 240ZG of the 70s" (black car, photo). "The ZG

has clear dome lenses over the headlight buckets, which under light give off two circular reflections over each headlight. We liked that unique characteristic and discovered that it naturally fit with the Z's identity."



The rear takes inspiration from the horizontal theme of the 300ZX taillights (photo, red car). Set within a rectangular black section that runs across the rear and wraps around the outer edges, the Z Proto's LED rear lights provide a depth effect that wasn't available when the 1980s car was designed and built.



VW ID4 EV Offers Matrix Beams

LIGHTING NEWS



The ID4 is the first in VW's global rollout of cars built on their mass-market MEB electric platform. It follows the ID3 compact hatchback, currently being launched in Europe. Unlike the Europe-focused ID3, the ID4 will be a global model, with the U.S. and China as key markets.

The car has LED headlamps that extend out into the VW badge at the centre, and—naturally on an EV—there's no grille because there's no radiator.



The top-line "Max" version includes features such as a panorama roof, an augmented-reality head-up display, VW's L² partially automated Travel Assist feature, and IQ Matrix LED headlamps. Each of these lights contains 11 LEDs and will automatically switch between upper and lower beam.



The VW ID.4 will also come with LED brake lights, with individual elements of the lights arranged to give the whole unit a 3D-effect. These lights also use nine fibre-optic cables each to display a richer red colour than conventional brake lights. The car's

front and rear lights will display animated dancing-light effects when the vehicle is locked or unlocked.

2021 Jaguar F-Pace: Progressive Design in Lighting

LIGHTING NEWS



For 2021, the F-Pace receives updated styling including slimmer headlamps and new taillights. The F-Pace won World Car of the Year and World Car Design of the Year.



The height of both headlamps and rear lights is reduced. A calligraphic twin-J signature is provided by the DRLs, and the headlamps have pixel-light technology with an optional laser high beam booster.



In the rear, the lights are slimmed down, and have a darker unlit appearance. The signature evolves towards a double graphic to echo the double-J signature up front, and there's a sequential direction indicator.

Hella Sell Front-Cam Software Biz

LIGHTING NEWS



HELLA CEO ROLF BREIDENBACH

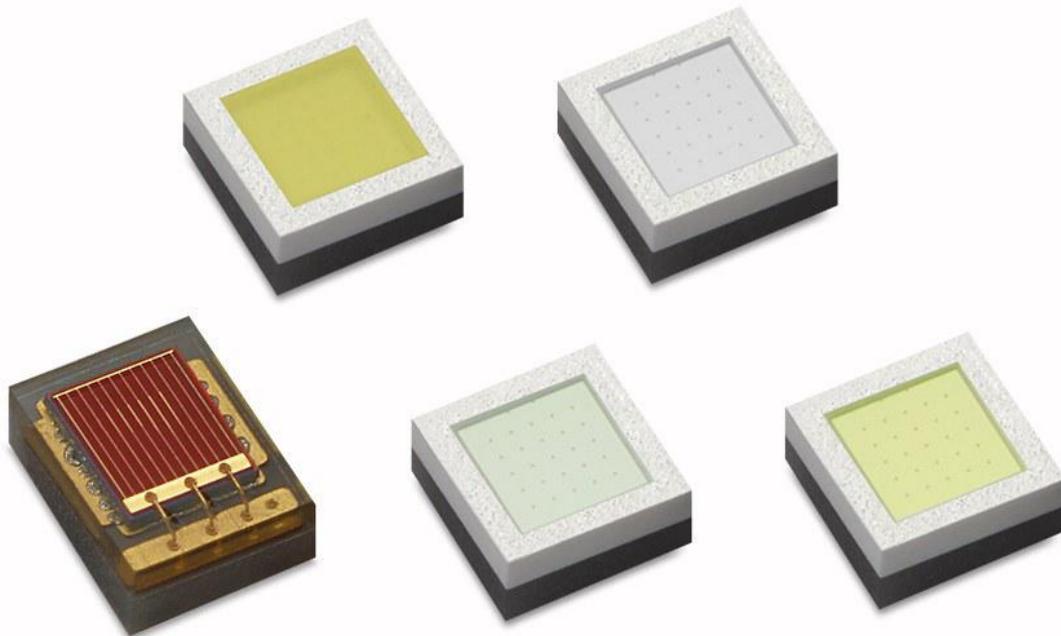
Hella have sold their front-camera software business to Volkswagen to raise around €100m.

Hella suffered punishing consequences from the pandemic in the first quarter of their new 2020–21 financial year, and had already felt the effects of softening car markets in the previous financial year. CEO Rolf Breidenbach justified his company's exit from the front camera software business with the fact that the group always has the strategic of technology leadership, market leadership and the fulfillment of certain financial indicators in mind; he says: "In order to achieve our goals in the long term, we would have had to make extraordinarily high investments in the area of front camera software combined with a high entrepreneurial risk. The exit from the business with front camera software is based on stringent portfolio management".

Other business activities of the subsidiary Hella Aglaia—energy management, lighting control and people counting devices (people sensing)—will not be affected by the sale, and Breidenbach says the group will continue to invest in electromobility, automated driving, software and digitalisation. Half of the employees previously employed at Hella Aglaia will move to VW's new "Car.Software" venture.

Lumileds' New Luxeon Rubix Colour LEDs

LIGHTING NEWS



A range of tiny and powerful colour LEDs has been launched by Lumileds. It's called Luxeon Rubix, and Lumileds describe it as a new colour LED building block designed to deliver maximum flux at drive currents up to 3A. With the modular architecture of the Luxeon Rubix range, engineers are freed from the design constraints of pre-configured modules and can create custom arrays with smaller optics supporting smaller size luminaires.

Lumileds Product Marketing Manager LP Liew says the new emitters are "a size and power ratio that has never before existed for colour LEDs...think of Luxeon Rubix as pixel-like—uniquely shaped arrays are possible, optics can be smaller, and exceptionally high light density allows solutions across a broad range of lighting segments to take new forms and increase their value".

Available colours are red, white, green, blue, and royal blue. Typical output for Red is 85 lm, Green is 310 lm, Blue is 112 lm, and the Royal Blue Rubix's output is specified by the maker as 1635 mW rather than in lumens. Typical output for white is 440 lm, for an efficacy of 93 lm/W.

The Auto Show's Uncertain Future

LIGHTING NEWS



MUNICH'S TRADE FAIR GROUNDS WILL HOST THE 2021 IAA

One year before the IAA—Germany's top auto show that is moving from Frankfurt to Munich—organisers are still struggling to confirm the attendance of a single non-German automaker or supplier. Even among German automakers, BMW are still the only company to commit to appearing at the show in their home city. Volkswagen, Audi, Porsche, Mercedes-Benz and Opel haven't yet confirmed attendance.

Frankfurt hosted the biennial exhibition of the industry's latest innovations for almost 70 years, but the VDA, the German industry group that organises the IAA, decided to move the show because of falling attendance figures. Munich convinced the VDA's board that its new trade fair grounds, its historic city centre, and highly attractive locations close to downtown could be used to host events for the show.

It is critical for the international reputation of the IAA to attract foreign companies or risk being seen as a regional event. Volvo are considering taking part in the show with their "Volvo Studios" mobility concept, which the company believe will work well in Munich. PSA, Renault, and Fiat still have to make a final decision on the Munich show.

This year, most high-profile shows, including those in Geneva, Paris and New York have been canceled due to the coronavirus pandemic and it is still unclear whether some of them will be held next year. The Beijing show closed yesterday, capping off a rare industry event being held in person during the pandemic. The Palexpo Exhibition Centre, the company that runs the Geneva auto show exhibition hall, say they want to stage a show in 2021. And the Detroit show has moved its dates (again) to 28 September through 9 October 2021, after having originally planned to move from January to June.

Driver Assistance News

Affordable Lidar for Automotive Applications

DRIVER ASSISTANCE NEWS



Cepton Technologies have revealed details of their latest automotive-grade lidar sensor, the Vista-X90, which the company say will be priced at less than USD \$1,000 in high volumes.

Cepton say the Vista-X90 sets a new benchmark for high performance at low power in a compact form factor, making it well suited for ADAS and AVs. Weighing less than 900 g, the unit has a range of up to 200 m at 10% reflectivity with an angular resolution of 0.13°, frame rates of up to 40 Hz, and power consumption under 12 W. The system features a licensable design architecture powered by Cepton's Micro Motion Technology (MMT): a frictionless, mirrorless, rotation-free lidar architecture capable of high-resolution and long-range 3D imaging, while maximising sensor robustness and reliability to meet the stringent requirements of automotive applications.

With packaging of 120 (w) × 110 (d) × 45 (h) mm and a 90° × 25° field of view, the directional, non-rotational design eases integration into areas such as a vehicle's fascia, behind the windshield, or on the roof.

Low NCAP Score for Tesla Autopilot

DRIVER ASSISTANCE NEWS



Tesla's Autopilot has ranked 6th out of 10 ADAS packages evaluated in a EuroNCAP safety performance assessment, scoring low on its ability to keep drivers engaged. The Tesla Model 3's Autopilot scored just 36 points when assessed on its ability to maintain a driver's focus on the road.

In contrast, the Mercedes GLE's system got 85 points to receive the top rating of 'very good' for driver engagement; the BMW 3-Series and Audi Q8 likewise ranked 'very good', and most other vehicles tested scored at least 70 points.

The European New Car Assessment Program, NCAP, which worked with UK insurance group Thatcham Research, called the assessments the first consumer ratings specifically focused on driver assistance systems.

Tesla's Autopilot has been criticised by the U.S. National Transportation Safety Board for allowing drivers to withdraw their attention from the road while the car carries on driving. U.S. regulators have investigated 15 crashes since 2016 involving Tesla vehicles equipped with Autopilot, a Canadian was recently [caught](#) literally napping while his Tesla drove along at 30 and 40 km/h above the speed limit, and an American garnered his 15 minutes of viral-video fame by getting completely out of the driver's seat of his Model S while the car tooted along at 100 km/h.

Safety and insurance researchers have frequently warned of the risks of consumers overestimating the systems' abilities, a misconception increased by some automakers calling their products by names like Autopilot. Tesla have been spanked by the likes of the influential Consumers Union (American publishers of Consumer Reports

magazine). Jake Fisher, Consumer Reports' Senior Director of Auto Testing, says "Despite the name, the 'Full Self-Driving Capability' suite requires significant driver attention to ensure that these developing-technology features don't introduce new safety risks to the driver, or other vehicles out on the road. Not only that, in our evaluations we determined that several of the features don't provide much in the way of real benefits to customers, despite the extremely high purchase price".

"Unfortunately, there are motorists that believe they can purchase a self-driving car today. This is a dangerous misconception that sees too much control handed to vehicles that are not ready to cope with all situations," said Matthew Avery, a Euro NCAP board member and research director at Thatcham Research. American safety authorities have made very similar comments.

General News

VW Say 2020 Delivery Growth Will Continue

GENERAL NEWS



HERBERT DIESS

Volkswagen Group CEO Herbert Diess says the automaker's September orders have been higher than last year, and that he expects the positive trend to continue in the fourth quarter.

In a sign that VW are recovering from the coronavirus pandemic that sent car sales plummeting, Diess also affirmed the company's target of positive operating profit for the year.

"The restructuring of the company has not been slowed down by corona, but accelerated," Diess said in prepared remarks at the company's annual shareholder meeting on Wednesday.

For the first eight months, VW Group's deliveries are still down 22% to 5.6 million vehicles with the sharpest drop of 31% in their home market of western Europe.

The ID.3 and the upcoming ID.4 are the first mass-market EVs VW are launching in the wake of the diesel emissions cheating scandal that has cost the company about €32bn. Diess has budgeted €33bn over five years' time to build the world's biggest EV fleet, leading some analysts to predict that VW will overtake Tesla as the EV-market leader by 2022.

Shuffle and Shakeup at Ford

GENERAL NEWS



JIM FARLEY

Ford's CFO Tim Stone is stepping down after only a year and a half in the position to take a new role at an artificial intelligence company, as Jim Farley takes over as CEO.

Stone is leaving to become COO and CFO of ASAPP, and will be the second US automaker CFO to leave this year for a technology company.

John Lawler, the head of Ford's autonomous vehicle company, will become CFO; he has held a number of roles during his 30-year career, including president of Ford China and CFO of Ford Global Markets.

Joy Falotico, Ford's Chief Marketing Officer and President of Lincoln, will step down as CMO to focus on her role leading Ford's luxury Lincoln brand.

Ford also announced a pair of retirements: Chief Information Officer Jeff Lemmer will retire this coming 1 January, and Dale Wishnousky, VP of Manufacturing for Ford Europe, will also retire at the end of the year—to be succeeded by Kieran Cahill, previously Ford of Europe's director.

U.S. Light-Vehicle Sales Find Momentum

GENERAL NEWS



Strong third-quarter results are bolstering hope for selling over 16 million units in 2021, as well as maybe a boost for the final 2020 total above the 14 million level.

