

Editorial

Please Raise Your Voice To DVN!

With weekly Newsletters and monthly Reports, we at DVN work hard to keep you well informed with news and analysis of what's going on in the world of driver and vehicle lighting and vision. We're reasonably sure most of you—the 1,000 Gold members—find our efforts worthy. We hear from you find DVN publications interesting and pleasurable to read, and some of you have told us you block out a chunk of time on Tuesday (or Wednesday, for our Chinese readers) specifically to read the Driving Vision News. Of course, we're very pleased to hear it!

Nevertheless, we'll be so much better able to meet your needs and wants when you will please give us some guidance by sharing your thoughts more specifically, because we don't get much in the way of detailed feedback from you. We'd love to have your suggestions and feedback to improve the value we deliver to you. It needn't be very complicated or time-consuming; just basic stuff: when you read the Newsletter any given week, or you read a Report, what do you find useful (or useless) about it? What do you think of the analysis; did you find yourself agreeing, or saying "Hey, now wait just a minute...!", or did you wish for more information or a different perspective?

Here we are at the cusp of Summer holidays, in countries where that's a thing. May we trouble you to please [drop us a line](#) and share your thoughts? Your input, which we will keep confidential, guides our work and increases the value and utility you get from DVN.

Meanwhile, this week's Newsletter includes detail on DVN achievements of the first semester. A lot of works done!

Sincerely yours,

DVN President



In Depth Lighting Technology

DVN's H1-2019 Achievements

As we reach the holidays for most of you—North Americans, maybe not—it's a fine time to evaluate DVN's achievements over the first six months of 2019: 25 Newsletters, 6 Reports, two Workshops, fruitful communications among DVN Gold members, and steady expansion of the DVN community.

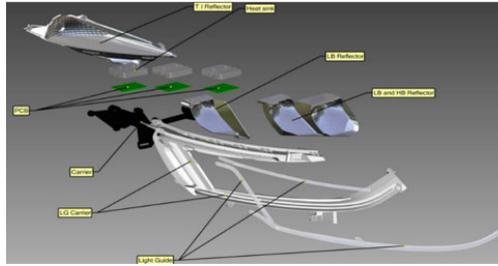
25 Newsletters were published, week after week without fail. That's 25 editorials, 25 in-depth features, and around 300 news articles about lighting, driver assistance, and relevant industry news. The DVN weekly Newsletter's purpose is to provide news and analysis of the important events, happenings, and product launches in the realm of lighting, driver and vehicle vision, and ADAS. It's the one-stop source for relevant news and views for our industry.

Six Reports were published on events including CES in Las Vegas, auto shows at Detroit and Geneva, and DVN Workshops in Michigan and China. We worked hard this year to make four especially important reports on:

- Volkswagen's lighting work
- Materials in vehicle lighting
- Regulatory evolution, and
- Future of exterior lighting.



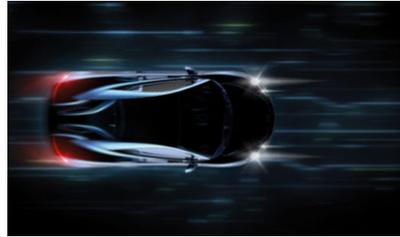
Touareg IQ Light (from VW profile)



Headlamp components (from Materials report)



GTB experts (from Regulatory update report)



Future of exterior lighting report

DVN Workshops were held—one in Michigan and the other in China.

The **US Workshop** brought a huge increase of the number of attendees and a fantastic level of lectures about the vehicle lighting industry.



The **Shanghai Workshop** was even a bigger success with the high level of lectures by worldwide speakers, the very interesting discussion panel session about regulation, and the quality of the exhibitions. I think it was one of the most successful DVN Workshops ever (so far!).



On our **DVN website**, several improvements are now operational: there's a new photo album section where DVN members can get high-resolution pictures—too large to put in our downloadable Reports—from our visits to major auto shows (NAIAS, Geneva, Mondial, Los Angeles, etc). There's also now a provision in the Workshop section to access lecture slides that have been released for publication by their presenters. And it's easier than ever for DVN members to update their company presentations in the Community section as often as they might wish.

DVN-I

And the most important achievement in H1-2019: we started an exciting new direction as we launched DVN-Interior with the aim of organising and serving the vehicle interior community in much the same way as we do for the lighting and vision community.

DVN-I Newsletters and Reports are geared to the needs and wants of automakers, interior system and component suppliers, and researchers of every stripe. The subject matter mix includes cabin and cockpit, controls and displays, seats, doors, trim, floors, overheads, steering wheels, centre stacks, and materials. DVN-I is led by Philippe Aumont, one of the greatest experts in the vehicle interior field. The goal is to facilitate communication and evolution toward mobility, interior design, real and perceived quality, safety, health, wellbeing, comfort; HMI, thermics, NVH, acoustics, audiovisuals, haptics, and the whole constellation of the vehicle-occupant interface.

And still to come in 2019...

Over the rest of 2019, we will crank out our customary 25 Newsletters and at 5 Reports. As usual, we will cover congresses, workshops, and auto shows, publishing reports on the main events. We will work hard to make five especially interesting reports in response to popular request, covering the IAA Frankfurt auto show, the ISAL congress, vehicle lighting in the US, and an update of our interior lighting report. What's more, a second DVN Lidar Conference is being planned for 2-3 December in Frankfurt.

Beyond that, we cordially remind you of the great benefits Gold members can access by logging in at DrivingVisionNews.com: Access to the DVN database with over 7,500 news articles and 140 published reports (and counting!), the DVN community directory with its detailed presentation of products and services from over 150 global supplier companies, and all of it readily siftable through an efficient keyword search engine.

LIGHTING NEWS

Coming Soon: the 13th ISAL



After having received over 800 experts at ISAL 2015, and around 1,000 at ISAL 2017, ISAL 2019 will welcome international designers, engineers, scientists and decision makers in automotive lighting industry on 24-25 September in Darmstadt.

The **steering committee** is chaired by Professor Khanh from TU Darmstadt; committee membership includes Audi's Wolfgang Huhn and Michael Hamm, Varroc's Rainer Neumann, Daimler's Stefan Töpfer, Dirk Vanderhaegen from Lumileds, Michael Kleinkes from Hella, AL's Ernst-Olaf Rosenhahn, Opel's Ingolf Schneider, Claus Allgeier of Osram Continental, and Joachim Ripberger of Valeo—all from Germany—as well as Koito's Masaru Sasaki from Japan, ZKW's Ralf Klädtke from Austria, and DVN President Hector Fratty from France.



Symposium chairman Prof. Khanh says "This year we have the best quality of abstracts. The topics can be grouped into blocks on matrix beam technology, road projection and positive/negative aspects, evaluation of headlamps as a system (CIE, ECE, IHS), new technology for rear lamps on the ground of LED-matrix display, AV communication with pedestrians, and virtual reality for tests and simulations".

To start off the symposium, Prof. Dr. Hermann Winner, TU will give a keynote on the safety issues involved with automated vehicles before the first session, with the rubric High Resolution Headlamps and Digital Light, gets under way with four lectures:

- Real Driving Benefits and Research Findings with Digital Light Functions (Hamm, Audi)
- Traffic Safety Benefits Provided by High Resolution Headlamp Systems (Rosenhahn, AL)
- Boost Safety & Styling—New HD-LED Systems for Front and Rear (Kleinkes, Hella)
- Micro-Pixel LED Headlights (Roth, Volkswagen)

At the end of the first symposium day, on Tuesday evening the 24th, a banquet will give the opportunity to make new contacts and refresh existing ones among participants. [Register or get more information online at www.lsal-symposium.de](http://www.lsal-symposium.de) .

Teslas Learn New Brake Light Tricks

Tesla have been upgrading some of their Model 3 cars already on the road in Europe with Dynamic Brake Lights. The California-based EV maker say the new feature will help avoid crashes.



It's part of the 2019.8.3 software update, which brings a variety of new and upgraded features to various Tesla vehicles depending on the model and market. Tesla describes the new feature: "If you are driving over 50 km/h (31 mph) and brake forcefully, the brake lights will flash quickly to warn other drivers that your car is rapidly slowing down".

In addition to flashing the brake lights, the new software also automatically activates the car's hazard warning lights under extreme deceleration. They're turned back off automatically as soon as the driver presses the accelerator or the hazard flasher switch.

It could be difficult for Tesla to introduce the feature in North America, where Federal regulations call for brake lights to be "steady burning" (i.e., of substantially unchanging intensity) and state regulations may also prohibit it. And besides, American-spec Model 3 cars use one and the same unusually-small red light on each side of the rear of the car for the brake light and turn signal/hazard flasher functions.

The feature, known in international UN Regulations as "Emergency Braking Display" (EBD) or "Emergency Stop Signal" (ESS), has been allowed and in use—in Europe and the many other countries where the UN Regulations are recognised—by other automakers for quite awhile. Daimler requested a limited, low-volume exemption from the American steady-burn requirement in 2005 so as to test ESS under American conditions, and NHTSA granted it in 2006, but ESS has not been approved for general equipment in North America.

Meanwhile, the same Tesla software update contains a new Autopilot function called "Autosteer Stop Light Warning", which will notify drivers audiovisually when the brake lights or turn signals illuminate on the car ahead. The cars will also, it is said, be able to recognise other drivers' intent to change lanes. In such a case, Autopilot adjusts its speed and allows the nearby vehicle to change lanes. It is to be hoped that the update addresses concerns with Autopilot's behaviour in traffic, which sometimes involved un-humanlike brake applications immediately before or after lane changes.

Car Makers Embrace Digital Lighting

One of the lighting industry ambitions for next-generation cars is to invest in technologies that improve the driving experience while also increasing safety. To optimise the human driver experience, every aspect of personal comfort is considered. Lighting plays a major role among these safety-centred technologies.

Digital lighting is developing at an accelerating fast pace to meet the growing demand for higher-resolution beams. Digital lighting enables high resolution front lighting systems which offer the possibility to develop new beam functions well beyond the basic low and high beams, all of which help to increase road safety and driver comfort.

Daimler have developed great examples of how digital lighting can look and work. As we have presented in DVN, Daimler's "Digital Light" system has a glare-free feature and provides resolution of more than two million pixels from the two headlamps. This system is connected to the camera and sensor system and adapts the headlighting beam pattern to traffic conditions; it's high-resolution ADB.



Image courtesy Mercedes-Benz

Lighting is—and surely will remain—an important and distinct feature for auto makers to differentiate in style and functionality. This is also the case for the future of electric and self-driving cars. Another illustrative example is the Volkswagen all electric I.D. VIZZION design concept, with which VW are exploring a variety of interactive lighting design concepts, as we detailed last year after DVN's visit to Wolfsburg.

Leoni Start Wireworks Sale Talks

German supplier Leoni said earlier this month they will explore a listing or sale of their wire and cables division, which supplies the healthcare, factory automation, transport, and automotive markets. Now they have begun meeting with prospective buyers for the company's wire and cables division, which is up for sale in a bid to bolster Leoni's cash position.



Having sent out information packages earlier this month, Leoni's management are now holding informal talks with potential bidders. Preparations for a listing of the unit have been delayed given market conditions, but Leoni are hoping to entice peers such as Huber+Suhner, Prysmian, Adient, or Deren. Private equity groups such as Triton, Bain, and KKR are also being courted, though banks would struggle to finance such a buyout. Leoni need to refinance Schuldschein notes worth about €200m (USD \$222.7m) next year; this past May they said their liquidity had decreased by a quarter to €740m at the end of March, of which €120m was in cash holdings.

In March, Leoni abandoned their 2019 profit targets, announced job cuts, and said the company's finance chief would quit. Reuters reported last December that Indian car wiring makers Motherson Sumi were in early talks with Leoni over a possible merger, but the negotiations never gained traction.

Osram-Continental's 8-Kilopixel Headlamps

Osram Continental's latest headlamp technology allows for extremely precise control of the beam pattern. Behind four projectors on prototype headlights installed in an Audi A6, there are 8,092 individually-controllable light pixels on eight LED modules. The advantage: higher-resolution ADB, with more precise shadows and more versatile ability to highlight obstacles, pedestrians, waypaths, and other items of interest with brighter light.



Michael Rosenauer, Osram-Continental's head of advanced development, says his team has been working on this technology for about three years; he predicts that the granularity of headlight control will continue to grow exponentially in the near future and that next-generation systems in a couple of years will have 25 kilopixels per chip (versus 1 kilopixel per chip on this present system). Each LED on the current prototype measures 4 mm²; the pixels are tiny.

Meanwhile, the low-volume Mercedes Maybach has its own highly sophisticated headlamps with millions of tiny reflectors (MEMS) to manipulate the beam and enable projection of much more sophisticated imagery. Rosenauer says Osram-Continental's technology will be much less expensive, cost-competitive with today's headlamps that use individual LEDs rather than pixellated LED modules. The standard headlamps on the 2020 Mercedes GLS, for example, each contain 112 LEDs. The LEDs can be individually controlled to shape the beam pattern, though obviously with less precision than the pixellated setup.

"4D" Printing and the Rise of Smart Materials

"4D" printing means producing a 3D multi-material printed part that reacts to external stimuli, such as heat, moisture or sound. In 4D printing, material is pre-programmed to have sensing and actuating abilities that allow the material to self-transform over time. When exposed to energy from heat, light or moisture, the printed component can morph into the chosen 3D shape. The part can also be returned to its original shape by applying the relevant stimuli.



3D printing offers an alternative way of producing the same product that might have been created using CNC machine or injection moulding before, 4D printing allows creation of parts that traditional manufacturing methods cannot fabricate. 4D printing will open access a whole range of functions that weren't feasible in the past. It is possible to print non-static, highly intelligent, active parts that can sense and self-transform, without the need for heavy and expensive sensors or motors. This ability will allow 4D printed products to thrive in the quest to form smarter and lighter products.

Smart materials are typically a niche area, and their fixed properties can make them difficult to implement, but using printing processes for rapid design and manufacturing opens a whole new world of highly customisable complex parts. The 4D printing market is still in an early R&D phase, and there is not yet a standard process or software package for 4D printing. Given these challenges, commercialisation is at least 10 years away.

There are potential automotive applications in these new materials technologies, especially in future autonomous vehicles. The BMW Design Department, working with MIT's Self-Assembly Laboratory, have successfully developed printed inflatable material technologies that self-transform, adapt, and morph from one state to another. The MIT lab created a "Liquid Printed Pneumatic" process, which uses air chambers that inflate or deflate in a stretchy material. The designs would be 3D-printed and programmed to respond to getting or losing air whenever needed; the breakthrough came when they managed to print air- and watertight inflatable geometries, like customised printable balloons. With this technology they can produce complex channels and pockets that self-transform.

Valeo Climb the Slope

Extract of J. Aschenbroich's Interview with Les Echos



"We are recovering: our results are in a phase of rapid improvement. Our profitability reached a low point in the second half of 2018, after historic records in the first half.

"Our customer mix in China, which was extraordinarily favourable until 2017, became less so in 2018. But in the second quarter of 2019, we were in line with the market. The fall of the Chinese market, the world's largest, was stronger than we had imagined. This is the first crisis experienced by our teams on the spot. They had to react, reduce the breakeven point, adapt the factories. Obviously, margins have fallen in the country, but remain very satisfactory.

"The automobile is a cyclical market: these two halves of decline after ten years of growth probably reflect the downward phase of the cycle. On the question of a deeper crisis, it is sometimes said that changes in consumer behaviour will make the car less necessary. We have done a lot of studies; we do not feel that this is the case. The need for mobility continues to exist, and shared mobility remains very limited. On the other hand, there is probably a phenomenon of waiting, linked to the difficulty of choosing today the type of vehicle that one needs, in a rather complex technological and regulatory environment.

"The market of electric vehicle is still small, but it is growing at 50% to 60% a year. 2020 will be a pivotal year in this respect: it will only be possible to achieve the European CO2 emission target of 95 g/km with strong hybridisation and [some] 100%

electric vehicles.

The challenge will be at what rate batteries will lower their cost and increase their energy density...and how will consumers adapt.

"There are actually two different markets: driving assistance, which is growing by more than 20% a year, and we are very strong in that regard. And the autonomous vehicle, which itself has two segments: that of the individual car, which will not happen for at least ten years, and that of robotaxis, which [are now starting] to arrive."

Koito Sales Up, Income Down

The Koito Group's first-quarter net sales increased 2.7% year on year from ¥192bn (€1.62bn, \$1.8bn) to ¥197bn (€1.66bn, \$1.85bn) led by an increase in new orders in the company's central vehicle lighting equipment segment.



Group sales grew worldwide, largely on strength of an increase in orders. In Japan, sales increased 7.4% year on year to ¥9bn (€76m, \$84m). In North America, despite the decrease in automobile production volume, sales came to ¥47bn (€396m, \$441m), almost the same as the previous year. In China sales increased 2.1% year on year to ¥23bn (€194m, \$216m), and in greater Asia sales decreased 7.7% year on year to ¥25bn (€211m, \$235m). This was mainly attributable to the decrease in automobile production volume and the completion of current round of new vehicle stage effects in Thailand and India.

In Europe, meanwhile, sales decreased 3.9% year on year to ¥10bn (€84m, \$94m). This was mainly attributable to the decrease in automobile production volume and the completion of current round of new vehicle stage effects or the end of production of some products in the region.

On the earnings front, operating income decreased 9.9% year on year to ¥19bn (€160m, \$178m) recurring profit decreased 14% year on year to ¥20bn (€169m, \$188m) and profit attributable to owners of parent decreased 11% year on year to ¥14bn (€118m, \$131m). This was attributable to increased R&D expenses and depreciation cost for strengthening production capability.

In the fiscal year ending 31 March 2020, global automobile production volume is expected to remain flat. Although new orders and the market transition to LED automobile lamps are expected to expand, net sales are expected to decrease slightly due to the effect of the currency exchange.

Jaén University's Plastics Training

Registration is now open for the fifth iteration of the University of Jaén's master's degree in advanced design of plastic parts and injection moulds, organised and directed with the collaboration of Andaltec (DVN recently [wrote](#) about Andaltec). This is one of the first master's degrees in Spain specialised in this field.



The training activity is organised by the Department of Graphic Engineering, Design and Projects of the UJaén, while Andaltec contribute part of the teaching staff and facilitate internships in companies. It will be developed throughout the next academic year on Friday afternoons and Saturday mornings so that professionals can participate. Indeed, the training is mainly aimed at engineers, technicians, architects, and surveyors. Registration for this year's session is open until 15 September, then enrolment will be formalised between the 16th and 19th.

The programme has a practical nature, so the classes will be taught in the CAD laboratories at the mould design and

manufacturing company Moldes Tuccibérica, and at the facilities of the Technological Center of Plastic, both located in Martos . Students will have the possibility of doing internships with several companies in the plastic sector of the province of Jaén, such as Valeo, Tuccibérica Molds, Arte Martos, and Ofitemar.

Andaltec manager José María Navarro highlights the good results obtained in previous sessions: almost all the students have found work immediately. "This is one of the most advanced training activities that can be taken in Spain in this area, as it will train students in the use of advanced industrial design software," he says. "These skills are in high demand by companies in the plastics sector, of which there is an important cluster in the province of Jaén".

DRIVER ASSISTANCE NEWS

Daimler, Bosch in Official Auto-Park Launch

Daimler and Bosch will start valet parking using autonomous driving technology in Stuttgart, Germany, after local authorities gave the automaker permission to start testing the technology.



The automated valet parking service will start at the Mercedes-Benz museum parkade, using infrastructure provided by Bosch and vehicle technology from Daimler. It will be the first fully automated, driverless system categorized as Level 4 automation which has been approved for everyday use.

The technology, accessed via a smartphone app, enables the car to drive itself to an assigned parking slot and park once the driver has left the parkade. It will return the car to the drop-off point in the same way. Bosch and Daimler have been cooperating on the development of fully automated driverless parking for several years.

Brose's Automated Vehicle Access

Supplier Brose say they have developed mechatronic systems to offer vehicle owners an entirely new access experience and pave the way to automated driving and car-sharing. The family-owned supplier claim as their unique selling proposition "perfectly harmonised and connected door and interior products from a single source".

brose

Technik für Automobile

Brose say even from a distance, the equipped car can recognise and welcome the driver with a projection on the ground. With a gesture, the vehicle user signals their desire to enter. The handle-free doors open automatically, while a radar sensor prevents collisions. At the same time, the windows—tinted to protect against heat and prying eyes—become transparent. The steering wheel disappears into the dashboard, and the seat contour adjusts automatically. The second row of seats is also completely electrified for better access to the back and can slide automatically, without any safety compromises: an interior sensor recognises people, pets, and children's seats in the vehicle and prevents injuries or damages.

Buckling up is also more comfortable as the belt is either easily accessible directly at the seat or is presented to the passenger electrically. Brose say they have applied their mechanical, electric, electronic, and sensor technology expertise to further develop their vehicle access system.

Visitors to the 2019 IAA in Frankfurt will be able to experience the latest features live at the Brose exhibition area under the motto "Enabling Future Mobility".

Luminar's Low-Cost Lidar for Production Cars

AV sensing startup Luminar say their latest automotive lidar platform, called "Iris", will be launched commercially on production vehicles in 2022 for less than \$1,000.



The firm claim Iris as the first sensing platform to 'exceed the essential performance, safety, cost, and automotive-grade requirements needed to deliver level-3 and -4 autonomous driving.

The Iris system comprises Luminar's high-resolution 3D sensing capabilities out to 250 metres—in a new, very compact package that can be integrated seamlessly into vehicles. Alternative configurations enable better and safer assisted driving (level 2+) functionality at a sub-\$500 pricing target for larger programmes, addressing the existing \$20bn ADAS market.'

The announcement comes just over a year after Luminar first introduced their sensor for autonomous development fleets, and two years after they originally unveiled their lidar technology, built from the chip-level up and using lasers of 1,550-nm wavelength, as it came out of stealth in 2017. Luminar also have revealed new perception software, offering functions for sensor fusion, auto-calibration, tracking, object detection, classification and simulation.

Luminar co-founder and CEO Austin Russel says "We're at a stage where everyone in the industry is hacking together Frankenstein solutions with off-the-shelf parts for their R&D programmes, but to successfully achieve series production autonomy, hardware and software have to be seamlessly developed and integrated in tandem. This combined, turnkey solution for series production vehicles is key to democratising autonomy in the industry, enabling every automaker to deliver on the promise of self-driving capabilities on their vehicles."

Russell says the Iris units offer automakers a turn-key system rather than one they have to cobble together on their own.

Starting in 2022, those lidar units will be assembled at one of two production facilities Because of the area's longstanding ties to the defence and aerospace industries, Luminar can find the high-tech work force they need to manufacture lidar at scale.

Veoneer's Financials



With net sales of \$489m, Veoneer's results are slightly better than their internal expectations had forecast. Veoneer succeeded with a capital raise in May 2019, with gross proceeds of \$627m including both common stock and convertible senior notes. Q2-19 order intake is in line with expectations: over \$1bn in average annual sales.

Outlook:

- LVP decline in the mid-single digits versus 2018
- Organic Sales¹ decline in the high-single digits versus 2018
- Currency translation impact on sales ~(-2)% versus 2018
- Operating loss improvement during H2'19 versus H1'19
- Cashflow expectation for FY'19 remains on track

Chairman, President, and CEO Jan Carlson says "The fusion of the automotive and technology industries is continuing, and this quarter we saw the pace of change accelerating with new alliances and partnerships being formed on almost a weekly basis. Industry announcements and statements during the quarter also confirmed that the main trend for the decade to come is collaborative driving, with fully autonomous vehicles only playing a significant role towards the end of the next decade".

GENERAL NEWS

Toyota in Top Slot for H1-19

Six months into the year, Toyota have maintained their lead over VW and the Renault-Nissan-Mitsubishi Alliance, and also have increased their growth over the same period last year.

	H1-2019	YoY	Est. 2019
Toyota	5.46	4.1%	10.9
Volkswagen	5.36	- 2.8%	10.7
Renault-Nissan	5.08	- 8.6%	10.2

World's largest car makers

No small achievements, these, in light of the global auto market having peaked and entered what could be a prolonged coast-down. Toyota prepared for this over nearly ten years' time, and that preparation is now paying off for them.

The Millionth Seat Leon

This week the third generation Seat Leon has achieved the million units sold mark since its launch in 2012.

Designed, developed and produced in Spain's Martorell municipality, the current-generation Leon has been built on VW's modular MQB platform since the beginning. This platform involved an investment of €800m at the time, and brought an unprecedented technological leap.



The success of the Leon transformed Seat's recent history from a commercial and financial standpoint, and drove a qualitative leap in the perception of the brand image.

Likewise, the Leon also enabled increasing the profitability margin per Seat model, which contributed to turning the negative figures of 2012 (-€149m) to the best ever in the history of the company (profit after tax of €294m 2018).

The Leon has been a key model for boosting sales in countries such as Germany and the UK, where deliveries have risen close to 70% and 60%, respectively, since 2012. The Leon is still Seat's top-selling model, and one out of every four cars sold by the brand in the first six months of 2019 was a Leon.

Of probably greatest importance to DVN readers, the Leon was the first high-volume popular-priced car with LED low and high beam headlamps as standard equipment.